ELECTRICAL REVIEW

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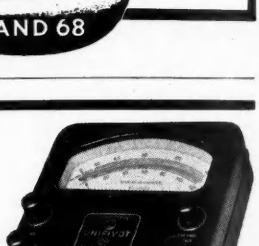

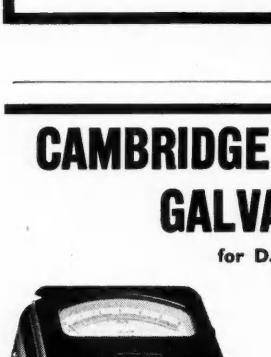

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ELECTRICAL REVIEW

Vol. CXLVI No. 3786 16TH JUNE, 1950

THE OLDEST ELECTRICAL PAPER • ESTABLISHED 1872

An All-In Convention

NEED TO DISPEL MISCONCEPTIONS

RECOGNIZING that the annual convention of the Incorporated Municipal Electrical Association served a useful purpose in the corporate life of the electrical industry the British Electricity Authority decided in 1948 that it should be carried on for at least another year.

The I.M.E.A. Conventions had been strictly "supply" affairs; the few representatives of other branches of the industry were in fact guests of the Association. Lord Citrine, with the National Electrical Convention of 1935 in mind, sought to enable manufacturers, contractors, traders and other members of the industry to participate on level terms.

Equal Representation

This was arranged and the first British Electrical Power Convention held at Torquay last year saw all branches represented in their own right and the programme was so devised as to give as much scope as possible to all parties.

But as a transition measure, presumably, the Convention proper was preceded by two days devoted to private meetings of B.E.A. and Electricity Board representatives and this tended to make it appear that other delegates were invited to join in afterwards. The idea was thus implanted that it was a B.E.A. Convention.

We find that this view still persists in some quarters, although this year there will be no separate B.E.A. meetings and the President, Sir Vincent de Ferranti, is a manufacturer. Everything possible must be done to convince people that this is not just the I.M.E.A. Convention under B.E.A. rules. Whatever basis is adopted for the settlement of representation the electricity supply branch must loom large, but the fact remains that half of the people at Harrogate will come from other sections—mainly manufacturing. Five papers are to be presented and three of them have been prepared by manufacturers' associations.

Dominant Themes

Power plant and supply are the dominant themes. Only one of the papers is on installation and utilization—and that in the specialist lighting field. Thus there is little for the electrical contractors who, although not so strongly represented as electricity suppliers and manufacturers, form an essential part of the industry. We may point out that subjects likely to interest contractors should generally appeal also to the other sections.

What can be done to convince everybody that the Convention is an all-industry function? Finance, as always, is the first thing to be considered. Each section must be prepared to bear an appropriate share of the cost and the B.E.A.'s contribution, though it will still be the largest, must not be out of proportion.

At present the B.E.A provides office

accommodation and staff. This of course accentuates the feeling that it is the Authority's show. But the staff possesses valuable experience which must not be dissipated. Can it be retained but somehow made quasi-independent?

Perhaps the present title is too suggestive of B.E.A. predominance. Would a reversion to the 1935 style, "National Electrical Convention," contribute to the wider acceptance which is aimed at?

Opportunities should occur at Harrogate for the discussion of these matters which vitally affect the character and ultimately the survival of the Convention.

WATER HEATING LOAD

It is interesting to see what is being done in other countries in the matter of water heating. In an analysis of revenue from different classes of consumption contained in the annual report of the Melbourne Electricity Department the figure for residential water heating is given as 0.416d per kWh sold. As the cost of bulk supply to the undertaking averages 0.787d it would seem that this load is much sought after, despite the difficult power situation in the State which has made it necessary to impose restrictions on electricity sales.

OIL OR ELECTRICITY?

In view of the decision of the London Transport Executive to replace its existing trams and trolley-buses by oil-engined vehicles it is worth noting that in Boston (Massachusetts) the Metropolitan Transport Authority is pursuing an opposite policy. Reporting a change-over from "gas" buses to trolley vehicles on a further route, the *Electrical World* says that "trackless trolley service continues to improve generating plant loading at Boston." What does the B.E.A. think of this?

JAPAN'S RESURGENCE

Several speakers have recently uttered warnings about the revival of competition from Germany and Japan. The latter is particularly dangerous for, in spite of the country's superficial "democratization," the remuneration of Japanese workers is still such as to permit a serious undercutting of British quotations. Sir Claude Gibb said last week that an Indian power plant contract had gone to a Japanese concern which quoted only about half of the figure put in by C. A. Parsons & Co. The Japanese plant was much less efficient, but it seemed that first cost was the main concern of some Indian engineers. That was apparently not the case in a recent New Zealand instance where British manufacturers secured a £1 million power plant contract in spite of Japanese, American and Continental competition.

BATTERY VEHICLE HOPES

We can quite believe the *Empire News* when it says that "special concessions to owners of electric vehicles under which batteries will be recharged cheaper during off-peak hours at power stations are being considered by the Government," although we would substitute "B.E.A." for "Government." But it is difficult to believe that "the establishment of a chain of charging stations is visualized by the Ministry of Transport." This fulfilment of the long-standing hope of the Electric Vehicle Association is devoutly to be wished, but it seems to us that the statement is based merely on a quite casual reference to the subject by the Minister of Transport in his speech at the recent luncheon of the Electric Vehicle Association.

CABLE EXPORTS

Further statements on export trade in cables have been made by Sir Montague Hughman (Henley's) and the directors of Siemens Bros. In both cases excellent overseas business last year is reported but a cautionary note is sounded in view of the shortage of sterling experienced in some countries, accompanied by import controls, and of the catching up of wartime arrears. But electrical expansion must proceed and any setback should be only temporary.

There has been no change in the position with regard to the withdrawal of overtime working by a section of the printing industry. A slight reduction in the number of pages in the *Electrical Review* accordingly continues to be unavoidable, and the next instalment of the series on "Electrical Contracting" by H. R. Taunton has had to be held over.

Cliff Quay Power Station

Officially Inaugurated Last Week

THE scheme for constructing Cliff Quay generating station on the north bank of the River Orwell about two miles to the east of Ipswich was well advanced in 1939, when tenders for 90 MW of plant had received approval. Progress was held up by the war, however, and in 1941 all work was stopped. It was not until late 1944 that a direction was given to proceed and this was followed shortly afterwards by a further direction increasing the ultimate capacity of the station from 180 MW to 270 MW.

The station's main constructional features were described in the *Electrical Review* for 26th March, 1948 (page 457) and it was commissioned on 22nd March, 1949. At the present time 180 MW of plant is in service and on Friday last it was officially inaugurated by Alderman S. C. Grimwade, J.P., who was chairman of the former Ipswich Corporation Electricity Committee. Work is still proceeding and it is anticipated that the station will be completed during 1952.

The site has the natural advantage of a deep water berth and an estuary supply of cooling water for the condensers. Wharf facilities allow 4,500-ton colliers to come alongside and the estuarine water enables a high vacuum to be maintained in the condensers giving a high turbine efficiency; during the first year of operation an efficiency of 28.4 per cent was obtained on units generated. Road and rail facilities are also available but all coal is waterborne from the North-East Coast.

For fuel the station uses coal with a calorific value of about 11,500 B. Th.U/lb, a storage space for 100,000 tons, or about six weeks' supply, being provided between the jetty and the front of the station. The coal is unloaded from colliers by three grab cranes each capable of moving 200 tons an hour and from this point it can be transported either to the storage dump or direct to the boiler bunkers, each of which has a capacity of 550 tons, by means of a system of conveyor belts.

The boiler house will eventually contain nine Babcock & Wilcox "High-Head" C.T.M. type pulverized fuel boilers incorporating twelve long-flame burners and each is designed to have an evaporative capacity of 365,000 lb/hr, the steam conditions at the stop valve being 635 lb/sq in at 850 deg F. There are three pulverizing mills per boiler, each of which is belt driven by a 100 h.p.

induction motor to give an output of 8.1 tons/hr. Furthermore, each boiler is equipped with automatic soot-blowers and two f.d. and two i.d. fans as well as two electrostatic precipitator units, the necessary high voltage d.c. being obtained by means of mechanical rectifiers.

As the output of ash from the station is estimated at 80,000 tons a year, its disposal has presented something of a problem. Ash is sluiced from the boiler hoppers and ejected from the precipitator hoppers to an ash sump in the boiler house basement. It is then pumped on to a 40-acre mudflat which has been dammed off from the river to the east of the station.

Automatic boiler control equipment has been installed and a master controller, actuated by steam range pressure, controls each group of three boilers. Compressed air is the operating medium for this system and each boiler has its own control panel fitted with controllers for all fans, regulating dampers, pulverizing mills and coal feeders, together with the usual indicating and recording instruments. By adjustment of a selector valve a boiler can be operated either as an independent unit or made to follow the master controller.

Generating Plant

When complete the turbine room will accommodate six 45 MW Metropolitan-Vickers turbo-alternators, disposed longitudinally down the length of the building. They have been designed to run at 3,000 r.p.m. and operate with steam conditions at the stop valve of 600 lb/sq in, gauge pressure at 825 deg F, exhausting to the condensers at a vacuum of 29 in Hg when running at the economic rating of 36 MW with circulating water at an inlet temperature of 60 deg F.

The turbines are two-cylinder double-flow machines with 22 stages in the h.p. cylinder and five double-flow stages in the l.p. cylinder. The alternators generate at 11.8 kV and have a rating of 56.25 MVA at 0.8 power factor; they are designed for forced air cooling, two 250 h.p. fans being provided for each machine, and the air is cooled by water via a heat exchanger. Apart from a separate flywheel motor generator exciter mounted on the turbine floor alongside each set, barring gear is fitted to turn the rotor at about 20 r.p.m. to ensure uniform cooling and permit easy starting.

There are five stages of feed heating which raise the water to 340 deg F with economic rating on the machines. The boiler feed pumps are installed at turbine operating floor level as also are the three high-pressure feed heaters associated with each set.

Each set is equipped with twin condensers having a net cooling surface of 50,000 sq ft and being supplied with 33,000 gal of cooling water per minute. There are six vertical type circulating water pumps driven by 750 h.p. 3 kV induction motors arranged for direct-on starting. These are situated in a pump house at the down-stream end of the station, the discharge being up-stream at about 1,000 ft from the intake, to avoid re-circulation. Chlorination plant is also provided to prevent condenser tube fouling.

Make-up water is obtained by softening town water, bled steam evaporators being provided for each set in which the vapour is condensed in an evaporator heater.

Each generator is connected to an 11.8/132 kV 54 MVA transformer situated in a compound at the front of the station, one being provided for each set. Air blast circuit breakers of 2,500 MVA rating on the 132 kV side connect the generators to the bus-bars. These are of the outdoor type and are located in a compound at the rear of the station.

The station auxiliaries are supplied from two 33/3 kV station transformers of 7.5 MVA rating and six 11.8/3 kV unit transformers rated at 4 MVA. The unit transformers are connected to the generator terminals and feed a unit board when the machines are running. For starting purposes these can be supplied from the station transformers. Each boiler has a 415 V board fed from a 3 kV/415 V transformer, from which all auxiliaries associated with that boiler are supplied. There is a 3 kV switch annexe in the turbine room above the main transformer bay running the length of the station; a smaller 3 kV board runs the length of the boiler house and in each case the unit transformers are situated on the floor below.

The main transmission from the station is at 132 kV, six lines at this voltage

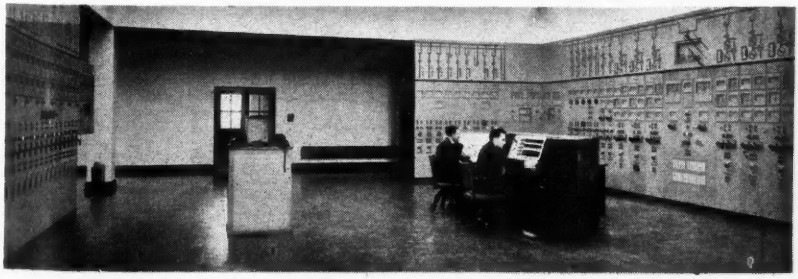
having been erected over the River Orwell on triple-circuit towers. There is also transmission by a 33 kV line to supply local loads, the 33 kV busbars being supplied from the 132 kV station busbars by means of two 30 MVA transformers.

The control room is in a separate building at the rear of the station adjacent to the switchgear compound. It is equipped with a central operating desk fitted with governor controls, field controls, and main step-up transformer on-load tap changing facilities. Apart from the usual annunciator panels a voltage regulator is provided for each generator and there is telephone and telegraph communication with the engine room and boiler house. The 33 kV switchgear is accommodated in two switch houses, one each side of the control room and in addition to controlling local supplies provides for the station auxiliaries.

Welfare facilities have been carefully considered in designing the station, there being a well-appointed canteen which is served by a modern electric kitchen and has a dining room capable of seating 300 people. In addition, facilities for cooking and eating food are provided throughout the station for the benefit of the men operating the plant.

The consulting engineers for the station are Merz & McLellan, for whom Sir Alexander Gibb & Partners are acting for the civil engineering works, and Farmer &

Above: The boiler house at firing floor level. Below: General view of the turbo-generator room



The control room with central operating desk

Dark were the consulting architects.

The main contractors include Edward Nuttall Sons & Co., Ltd., civil engineering work; Babcock & Wilcox, Ltd., steam raising plant; Metropolitan-Vickers Electrical Co., Ltd., turbo-alternators, condensers, 132 and 33 kV switchgear; Aiton & Co., Ltd., pipework; Drysdale & Co., Ltd., c.w. pumps, G. & J. Weir, Ltd., feed pumps and live steam evaporator; Hopkinsons, Ltd., h.p. valves; J. Blakeborough & Sons, Ltd., l.p. valves; Ransomes & Rapier, Ltd., and Babcock & Wilcox, Ltd., turbine house cranes; Lodge-Cottrell, Ltd., precipitators; Permutit Co., Ltd., feed water treatment plant; Wallace & Tiernan, Ltd., chlorinating plant; Robert Dempster & Sons, Ltd., coal handling plant; Christy Bros. & Co., Ltd., lighting.

English Electric Co., Ltd., auxiliary switchgear; Ferranti, Ltd., 132 kV generator transformers; Hackbridge & Hewittic Electric Co., Ltd., 33 kV and lower voltage transformers; British Insulated Callender's Cables, Ltd., 33 kV and lower voltage cables and accessories; Pirelli-General Cable Works, Ltd., 132 kV cables and accessories.

Before the opening ceremony 200 guests attended a luncheon when the Mayor of Ipswich (Alderman C. Catchpole) proposed the toast of the new station, describing it as one of the finest in the country. Lord Citrine (chairman, B.E.A.), replying, said that the station contained some of the biggest boilers in the world, certainly some of the biggest in the country. But size had not been allowed to interfere with the station's design, and it was one of the most handsome civic buildings he had seen.

Among the guests, numbering some 200, present at the luncheon were Lady Citrine, Sir John and Lady Hacking, Dame Caroline Haslett and Mr. and Mrs. W. N. C. Clinch. After declaring the station open Alderman S. C. Grimwade unveiled a plaque on the station entrance hall commemorating the occasion. In the course of the speeches reference was made to the work of Mr. H. E. Blackiston and Mr. G. A. Vowles (former borough electrical engineers) and Mr. H. B. Campbell (station superintendent) in connection with the scheme. Subsequently the visitors inspected the station and also the s.s. *Cliff Quay* which had just completed her maiden voyage.

Cables in Pipes

Contract for 132 kV Compression Type

THE British Electricity Authority has announced the award to Enfield Cables, Ltd., of a further contract for 132 kV compression cable, for installation on the Portsmouth-Wymering route. The route length is 6,500 yd at 85 MVA capacity, single circuit; there will be three oval lead covered cores drawn into a steel tube. The conductor size is 0.25 sq in and the pipe is 5¼ in outside diameter by 7 gauge, nitrogen filled, the pressure being maintained at 200 lb/sq in.

The contract, which follows the placing of the Braehead (Glasgow) order for 20,000 yd of similar, although larger, cable, suggests a trend here towards the use of pipe line cables, which is so noticeable in the United States. In their 1948 C.I.G.R.E. paper, Messrs. Komives and Halperin showed that, at that time, pipe line cables were being installed at four times the rate of alternative designs. This change can be explained in several ways, two of the most likely being the greater flexibility in installation in crowded districts and the high degree of mechanical protection offered by the pipe. Moreover, Mr. E. R. Thomas, of the Consolidated Edison Co., has suggested that elimination of oxygen from contact with the sheath surface is a protection against corrosion and effects of vibration.

The Enfield Company installed the first commercial pipe line compression cable (66 kV) in the world in 1932. This was between Hackney and Walthamstow and is still in service.

Enfield 132 kV compression cable

BIRTHDAY HONOURS

Electrical Names in Last Week's List

In our last issue we reported some of the principal awards to electrical men in the King's Birthday Honours List. A fuller list is now given of those in the electrical and allied industries who have been honoured. As we have already mentioned, SIR CYRIL W. HURCOMB, G.C.B., K.B.E., chairman of the British Transport Commission, becomes a baron, SIR BEN LOCKSPEISER, LL.D., M.I.Mech.E., F.R.Ae.S., F.R.S., secretary of the Department of Scientific and Industrial Research, is created K.C.B; knighthoods are conferred upon MR. C. B. COLSTON, C.B.E., M.C., D.C.M., chairman of Hoover, Ltd., and the C.B.E. is awarded to MR. A. G. RAMSEY, O.B.E., M.Inst. C.E., M.I. Mech.E., M.I.E.E., chief mechanical and electrical engineer, Ministry of Works, MR. H. J. RANDALL, F.C.I.S., chairman of the London Electricity Board, and MR. G. M. WRIGHT, M.I.E.E., engineer-in-chief of Marconi's Wireless Telegraph Co., Ltd.

In addition to these, MR. A. J. BOYD, chairman of the Railway Carriage & Wagon Builders' Association, and a director of a number of companies, including Associated Electrical Industries, Ltd., is created a knight, and a similar honour is conferred upon MR. H. H. HARLEY, C.B.E., chairman of the Coventry Gauge & Tool Co., Ltd. MR. R. A. LITTLE, C.B., Director-General, G.P.O., becomes a K.C.B.

The C.B.E. (Civil Division) is awarded to COL. J. F. DARBY, T.D., A.M.I.E.E., Deputy Regional Director, Midland Division, G.P.O., and the C.B.E. (Military Division) to MAJOR-GENERAL S. W. JOSLIN, M.B.E., B.A., M.I.Mech.E., M.I.E.E., late R.E.M.E.

In the list of O.B.E. awards appear MR. A. H. BANKS, chief labour relations officer, British Electricity Authority, MR. D. C. ESPLEY, D.Eng., M.I.E.E., senior telecommunications engineer, research laboratories, General Electric Co., Ltd., MR. P. A. FLORENCE, engineering establishment officer to the B.B.C., MR. W. J. McC. GIRVAN,

Sir Cyril Hurcomb

Sir Ben Lockspeiser

Mr. C. B. Colston

Mr. H. J. Randall

Mr. A. G. Ramsey

Mr. G. M. Wright

Mr. A. H. Banks

Mr. W. J. McC. Girvan

A.M.I.E.E., city electrical engineer and general manager, Belfast, MR. W. H. GLASS, technical director, Thermotank, Ltd., MR. T. G. MANDER, J.P., director, Sheffield & District Engineering Trades Employers' Association, Mr. C. A. L. NICHOLLS, M.I.E.E., Assistant Controller General, Posts and Telecommunications, Frankfurt, Control Commission of Germany, British Element, MR. W. J. PICKEN, M.I.E.E., principal scientific officer, Department of Physical Research, Admiralty, and MR. R. P. RICHARDSON, managing director, Burndept, Ltd. The O.B.E. (Military Division) is awarded to LT.-COL. (TEMP.) J. E. S. SANDERS, B.A., A.M.I.E.E., Royal Corps of Signals.

The M.B.E., has been awarded to MR. A. W. BRISCOE, works engineer, John Thompson, Ltd., Wolverhampton, MR. J. O. H. EASTON, cable works plant and maintenance engineer, Siemens Bros. & Co., Ltd., MR. H. GILL, A.M.I.E.E., resident engineer, North Wales hydro-electric stations, Merseyside and North Wales Division, B.E.A., MISS J. E. HARE, supervisor, central accounts office, Surrey Sub-area, South Eastern Electricity Board, MR. R. J. P. MACDONALD, production superintendent, Henry Wiggin & Co., Ltd., Glasgow, MR. J. M. MARKEY, area engineer, Telephone Manager's Office, York, G.P.O., MR. H. J. MARSHALL, superintendent, Electrical Department, Muirhead & Co., Ltd., MR. W. MOORE, M.I.E.E., lately Sub-Area engineer, Nottingham, East Midlands Electricity Board, MR. F. WOODS, M.I.E.E., manager, Woking District, South Eastern Electricity Board, MR. E. W. MARVILL, works superintendent of F. Perkins, Ltd., and MRS. R. MESSENGER, J.P., adviser on women's work, Eastern Electricity Board, and member of the E.A.W. National Advisory Council.

Awards of the B.E.M. have been made to MR. G. W. HALL, auxiliary plant attendant, Carville power station, N.E. Division, B.E.A., MR. T. HEATON, boiler house foreman, N.W. Division, B.E.A., MR. W. HEMMINGS, electrical foreman, Cardiff Docks, MR. R. IRVINE, fitter, Portobello power station, South East Scotland Division, B.E.A., MR. A. MAINWARING, jointer, class I, North Western Electricity Board (Westhoughton, Lancs.), MR. E. V. PAYNE, D.C.M., M.M., mains foreman, Southern Electricity Board (Portsmouth), MR. H. SARTAINE, foreman fitter, S.W. Division, B.E.A. (Portishead), MR. A. R. SMITH, mains foreman, Hampstead, London Electricity Board, MR. J. H. TUNALEY, chief maintenance electrical foreman, English Steel Corporation (Manchester), and MR. A. WHITE, skilled fitter, Westinghouse Brake & Signal Co., Ltd.

N.A.L.G.O. and Electricity

A MEETING of electricity staffs held at Eastbourne on Monday in connection with the annual conference of the National Association of Local Government Officers was addressed by Mr. L. G. Moser, the national electricity officer. He said that the completion of the final salary agreement just before the target date (see *Electrical Review*, 7th April, p. 672) overshadowed the rest of the year's work in the electricity field. There had been disappointment because telephone operators, drawing office staff and certain miscellaneous grades had not yet been dealt with; some of these brought them up against the difficult problems of demarcation with which, he was glad to say, they were at last getting to grips. There had been preliminary discussions regarding bonus payments, and other matters dealt with included staff rates for electricity and motor car allowances.

Another problem on which much time had been spent had been the establishment of negotiating machinery for the managerial and higher executive grades. For some reason there had been reluctance to recognize N.A.L.G.O. as an "appropriate organization" for these staffs, despite the fact that the large majority of those in non-engineering posts were members of the Association. However, working in close co-operation with E.P.E.A., a solution establishing the Association's representation appeared to have been reached.

Yesterday (Thursday) was to be devoted to the consideration by the conference of a special report and scheme of the National Executive Council on the adaptation of the Association machinery to meet present conditions. The two main factors have been the remarkable increase in membership (from 100,000 in 1938 to 189,000 at present) and the Association's decision to retain its membership, and to recruit in the nationalized industries. Membership in the electricity supply industry is in the region of 26,000.

B.S.I. Annual Meeting

The annual general meeting of the British Standards Institution will be held on Tuesday, 11th July, at 3 p.m., at 24, Victoria Street, London, S.W.1.

PERSONAL and SOCIAL

News of Men and Women of the Industry

THE gold Albert Medal of the Royal Society of Arts for 1950 has been awarded, with the approval of Princess Elizabeth, President of the Society, to **Sir Edward Victor Appleton,** G.B.E., K.C.B., "for outstanding services to science and industrial research." Sir Edward Appleton, who is now Principal and Vice-Chancellor of Edinburgh University, was Wheatstone Professor of Physics at the University of London from 1924 to 1936, and Jacksonian Professor of Natural Philosophy at Cambridge University from 1936 to 1939. From 1939 to 1949 he was Secretary of the Department of Scientific and Industrial Research. He was awarded the Nobel Prize for Physics in 1947. The presentation of the Medal will be made privately by Princess Elizabeth in the autumn.

In view of the impending retirement of **Mr. J. D. Bendix, Mr. W. T. Spittle** has been appointed station superintendent at West Ham generating station of the London Division of the British Electricity Authority. Mr. Spittle commenced his career in the industry in 1906 at West Ham.

Mr. G. H. Smethurst, A.M.I.Mech.E., has recently been appointed a generation engineer (construction) in the B.E.A. North Western Division. Mr. Smethurst received his technical education at the Manchester College of Technology and he held successive appointments with the International Combustion, Ltd., Derby, Simon-Carves, Ltd., and the West Midlands J.E.A. before joining the staff of the Manchester Corporation Electricity Department in 1930. During the 1914-18 war he served overseas with the Royal Engineers. Mr. Smethurst was senior assistant engineer in the N.W. Division of the B.E.A. before taking up his new appointment.

Mr. G. H. Smethurst

Mr. W. J. Tabraham, secretarial officer, Fens Sub-Area, Eastern Electricity Board, formerly secretary and accountant of the Cambridge Electric Supply Co., Ltd., was presented on 7th June with a wallet of money subscribed by his colleagues and friends to mark his retirement after nearly fifty years' service with the Board and its predecessor.

Mr. W. H. Lythgoe, M.I.E.E., A.M.I.I.A., M.Inst.Met., has been appointed assistant chief engineer of W. T. Henley's Telegraph Works Co., Ltd. Mr. Lythgoe joined the Henley research laboratories in 1924. Five years later he transferred to the technical staff of the company's power cable factory and has since worked mainly on problems relating to the development and production of power cables, particularly on the super-tension side.

Mr. W. H. Lythgoe

Mr. R. E. Burnett, M.A.(Oxon.), A.M.I.E.E., has been appointed manager of the Education Department and principal of the Marconi College at Chelmsford, from 1st June. Mr. Burnett was recently occupied with special duties in connection with the recruitment of specialists for overseas Governments. Before that he was head of the mathematics, physics, and electrical engineering side of the Technical and Scientific Register of the Ministry of Labour. He will also be responsible for the recruitment of technical personnel at Marconi's in collaboration with the central personnel services of the English Electric group.

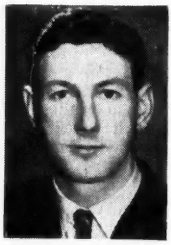
Mr. F. Williams, late of Dudley Electrical Wholesale Supplies, Ltd., has now been appointed sales representative for the Black Country area with Electrical Engineering Supplies (B'ham), Ltd.

Mr. L. Hart, publicity manager of the Brush Electrical Engineering Co., Ltd., has been elected to the Council of the Incorporated Society of Advertisement Consultants.

Sir Cyril Hurcomb, chairman of the British Transport Commission, who is visiting Norway and Sweden, hopes to inspect the Norwegian State Railways and to see part of the electrified system of the Swedish State

Railways He will return to this country on 25th June.

Mr. W. F. Griffiths, B.Sc.(Eng.) Hons., F.I.E.S., joined Crompton Parkinson, Ltd., on 22nd May as chief street lighting engineer. He received his training with Holophane, Ltd., and after war service in the Royal Corps of Signals, attaining the rank of major, he joined Siemens Electric Lamps & Supplies, Ltd., with whom he became manager of the Illuminating Engineering Department in 1947.



Mr. W. F. Griffiths

At a meeting of the Council of the Public Transport Association held on 8th June, **Mr. G. F. Sinclair,** C.B.E., M.I.E.E., M.Inst.T., A.M.I.Mech.E., was unanimously re-elected for a second year of office. **Mr. W. T. James,** O.B.E. and **Mr. R. I. H. Longman** were re-elected vice-chairmen.

Mr. I. J. Shelley has been elected chairman of the London Students' Section of the Institution of Electrical Engineers for the 1950-51 session. Mr. Shelley joined the Post Office Engineering Department in 1940 and in 1946 was appointed to the B.B.C. Lines Department. Since 1949 he has been a member of the Television Transmission Section of the Designs Department. Mr. Shelley was awarded a premium for a paper to the Radio Section of the I.E.E. in 1949. The vice-chairman of the London Students' Section is **Mr. K. Pounds,** B.Sc.(Eng.), who is on the editorial staff of the *Electrical Times,* and the secretary is **Mr. B. L. A. Ellings,** a member of the Technical Department of the London Division, B.E.A.

Messrs. D. C. Lorkin and **S. G. Mundy,** directors of Lancashire Dynamo & Crypto, Ltd., have just completed a tour of Canada and the United States on behalf of the company and its subsidiaries, during which motors to N.E.M.A. dimensions were introduced to the Canadian market and preliminary orders were obtained. Substantial orders were also received from the Hydro-Electric Commission of Ontario. Arrangements were made for expansion in sales of products of the company's subsidiaries.

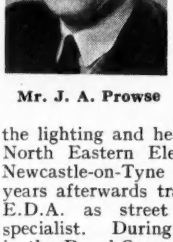
Mr. A. W. Cale, manual personnel officer to the London Division of the British Electricity Authority retired on 1st June. Mr. Cale commenced his career in the electrical industry in 1926 with the London Power Co. and was appointed personnel officer at vesting date. **Mr. A. Anderson** who succeeds Mr. Cale commenced with the Charing Cross Co., at Bow generating station in 1918 and was later transferred to the London Power Co.

Mr. H. F. Chastney has been appointed deputy secretary to the London Division of the British Electricity Authority. Mr. Chastney commenced his career with the St. James & Pall Mall Electric Light Co., Ltd., in 1917, and joined the staff of the London Power Co., Ltd., in 1926. At vesting date he was appointed establishment officer to the London Division.

Mr. G. J. Rackham has been appointed a director and chief engineer of Simms Motor Units, Ltd. Mr. Rackham was until recently director and chief engineer of the Associated Equipment Co., Ltd., and previous appointments held by him were chief engineer of the Yellow Coach Co., Chicago, and chief engineer of Leyland Motors, Ltd. He took up his new duties on 12th June.

At a recent informal ceremony at the North Woolwich cable factory of **W. T. Henley's Telegraph Works Co., Ltd.,** two veterans, each with over fifty years' service, were presented with framed engrossed copies of resolutions expressing the company's gratitude for their long and loyal service. Both of these employees, Mr. A. H. Hinds and Mr. W. Killan, were congratulated by Sir Montague Hughman, chairman of the Henley organization, who made the presentations on behalf of the board, and also handed to them gifts of savings certificates from the company and gifts from himself and Lady Hughman.

Mr. J. A. Prowse, F.I.E.S., Associate I.E.E., a technical officer on the E.D.A. staff since 1937, has been appointed domestic and commercial development engineer of the No. 4 (Preston) Sub-Area of the North Western Electricity Board and takes up his new post early in July. After an apprenticeship with the Artic Fuse and Electrical Manufacturing Co., Birtley, Co. Durham, Mr. Prowse joined the lighting and heating department of the North Eastern Electricity Supply Co. at Newcastle-on-Tyne in 1926, and eleven years afterwards transferred to the staff of E.D.A. as street lighting and lighting specialist. During the last war he served in the Royal Corps of Signals. Mr. Prowse returned to E.D.A. in November, 1945, since when he has taken a large part in



Mr. J. A. Prowse

arranging agricultural shows. Latterly he was responsible for the technical direction of the three new E.D.A. agricultural films and the "Clean Milk" film.

On 15th May the semi-finals and finals of ladies' and gentlemen's table tennis and darts tournaments were played in the staff canteen of **Falk, Stadelmann & Co., Ltd.** The winner in each section received a silver challenge cup, to be competed for annually, and the runners-up were awarded table tennis paddles and darts respectively. Presentations were made by Mrs. Walter Thurner, the wife of one of the directors. Mr. H. E. Knight, chairman of the Social Club Committee, stated that the competitions were the first to be held since the war, and Mr. Walter Thurner thanked the Committee for its work.

On 8th June the South Midland Supply and Utilization Section of the Institution of Electrical Engineers held its summer outing. Coaches left Birmingham for Courtauld's Works, Coventry, where they were met by officials of the company. An extensive tour of the works was made, and the various processes fully explained by guides. Following this visit the coaches were rejoined and left for Kenilworth, where lunch was taken. From Kenilworth the party proceeded to Warwick Castle and grounds. High tea was served in Warwick, after which the coaches returned to Birmingham via Stratford-on-Avon. The chairman of the South Midland Centre, Mr. H. J. Gibson, chief commercial officer of the Midlands Electricity Board, accompanied the party.

OBITUARY

Mr. E. P. Prior.—The death occurred on 5th June at the age of seventy-five of Mr. Edward Polus Prior, district manager for Walsall Conduits, Ltd. Mr. Prior was attached to the company's Nottingham, Birmingham and Sheffield depots. He had been associated with Walsall Conduits since 1922, and before he went to Nottingham in 1927 was their representative in Belfast. Earlier in his career he worked in India as an electrical engineer.

Mr. A. P. MacAlister. — The death occurred on 10th June at the age of seventy-two of Mr. Alexander Percy MacAlister, M.I.E.E., former borough electrical engineer at Islington. Mr. MacAlister commenced his career in the electricity supply industry in 1899 as a draughtsman at the Croydon electricity works, where he later became charge engineer, mains engineer and technical assistant in charge of extension work. He was appointed mains superintendent to the Battersea Electricity Department in 1904, and later became chief assistant engineer and acted as chief engineer pending the appointment of Mr. Bond. His next appointment was as chief assistant and deputy electrical engineer of the Islington Electricity Department, of which he became chief engineer in 1927. He retired in January, 1946. Mr. MacAlister served on various panels of the British Standards Institution and had been president of the Association of Municipal Electrical Engineers, of which he was also at one time hon. secretary.

Mr. W. D. Reid, whose death at the age of eighty-seven occurred on 21st May, was before his retirement from the former Callender's Cable & Construction Co., Ltd., in 1942, for many years the company's chief engineer for Scotland. His service with Callender's dated from 1888. Following his retirement from Callender's, Mr. Reid was technical director of the Skelmorlie Electric Supply Co., Ltd., Scotland, until his retirement from business in 1948.

Mr. F. C. Outram.—The death occurred on 27th May, after a long illness, of Mr. F. C. Outram, generation engineer (operation) in the London Division of the British Electricity Authority. The feneral service took place at Putney Vale Crematorium on 2nd June, four of his old colleagues at Fulham acting as bearers, and in attendance were the divisional controller (Mr. J. N. Waite), and many friends with whom he was associated during his service.

WILLS

Mr. A. C. MacWhirter, M.I.E.E., electrical engineer, who died on 28th December last, left £17,929 gross (£17,772 net).

Mr. A. L. Vanneck, A.M.I.E.E., for many years on the engineering staff of the General Electric Co., Ltd., who died on 6th April last, left £1,609 gross (£1,547 net).

Mr. A. G. Beaver, chairman of the Sun Electrical Co., Ltd., who died on 21st March last, left £22,387 gross (£22,079 net).

Mr. P. Williams, former electrical engineer and manager to the Holyhead U.D.C., who died on 28th January last, left £7,177 gross (£7,094 net).

Mr. C. C. Atchinson, M.I.E.E., J.P., formerly with the Metropolitan Electric Supply Co., and Rochdale Corporation, who died on 2nd January last, left £25,016 gross (£24,475 net).

Mr. L. A. Darby, manager of the London depot of the Chloride Electrical Storage Co., Ltd., who died on 21st January last, intestate, left £10,531 gross (£10,283 net).

Mr. T. H. Varcoe, A.M.I.E.E., manager of the Birmingham branch of Siemens Electric Lamps & Supplies, Ltd., since 1920, left £13,653 gross (£13,543 net).

VIEWS on the NEWS

By REFLECTOR

WHEN we in this country complain of the injustice of the purchase tax we are likely to overlook the fact that imposts of various kinds are also placed upon goods in other countries. A bulletin published by the Fluorescent Lighting Association (New York) contains a protest from a manufacturer against an excise tax of 20 per cent on cold-cathode fluorescent lamps which, he contends, limits sales. Here the purchase tax on fluorescent lamps (up to 80 W) is 33⅓ per cent, which must have an even worse effect.

★ ★ ★

Each of the papers which is being read at the British Electrical Power Convention at Harrogate next week bears a note saying: "This paper, which will be presented on [date], is issued on the distinct understanding that the text shall not be reproduced nor shall extracts therefrom or a summary thereof be published prior to the date upon which the paper is read." This note appears to have escaped detection in some quarters for in the May number of "British Electricity," which I saw early last week, there are summaries of all five papers.

★ ★ ★

Mr. Robert Barstow (of Audenshaw, Manchester) tells me that the latest "electricity and fish" story to which I referred in my notes of 2nd June does not come direct from Russia but from Stockholm and was occasioned by the presence of Russian fishing vessels in the Channel. Mr. Barstow says it is only a "sensation-seeking re-hash of information" which has been available in this country through normal scientific channels for several months; in fact, an illustrated report appeared in the January 1950, issue of *Discovery* based on an account in the October, 1949, issue of *Tekhnika Molodezhi* and the work of M. F. Chernigin.

"Britain is pressing on with plans that will double the electric power carried to all parts of the country," says the *Daily Herald*. The reference is to B.E.A.'s 275 kV transmission experiments. The paper mentions the equipment at Leatherhead and states that "from these 90 feet high, 120 feet wide gantries, stationed 400 yards apart, gas-filled cables will carry a vastly greater voltage than the solid cables now slung between the pylons." Yet later on it quotes a B.E.A. engineer as saying that the conductors will be of the ordinary type, but differently strung.

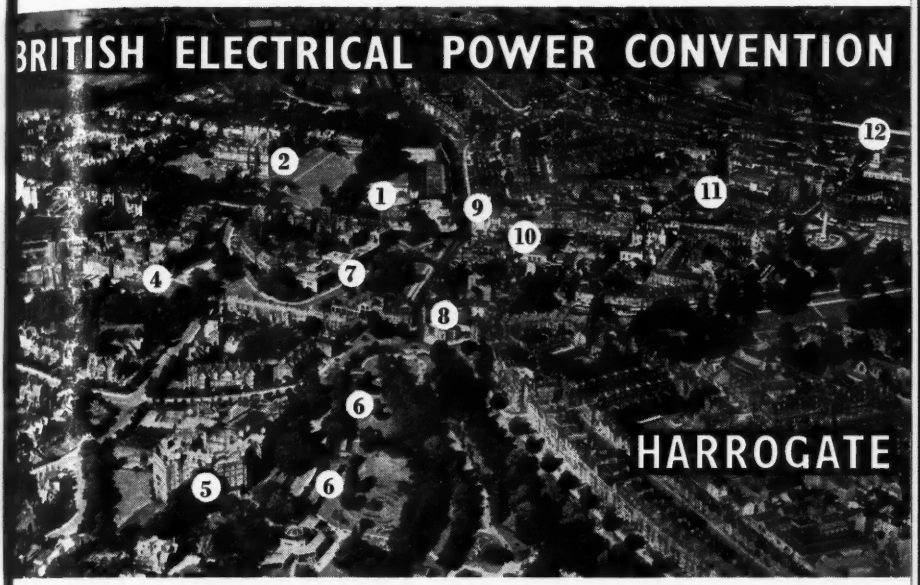
★ ★ ★

Referring to "elaborate" surveys now being made by the B.E.A. in its efforts to establish a uniform tariff system, the *Sunday Times* said recently that the surveys were being made by officials of the Area Boards "as it was felt that householders would rather admit an official for a rapid inspection than go to the labour of measuring rooms and filling in complicated forms." Judging from the outcry about "official snoopers" in the Press I have my doubts about this. In any event one or two of the Boards are employing quite simple forms for the purpose.

★ ★ ★

An article in the *Board of Trade Journal* deals with the growth of the "super-market" in the United States. This is a large store in which the customer collects what she wants from the counters and pays at an exit—on the lines of a cafeteria. Food appears to be the principal commodity handled by these stores, but I see that there are references to many other kinds of goods, including "major appliances (refrigerators, etc.)." A refrigerator does not appear to be the easiest thing to pick up from a store and carry away even though there is a suggestion that push carts are provided.

BRITISH ELECTRICAL POWER CONVENTION



1. Royal Hall
2. Majestic Hotel
3. Cairn Hydro
4. Harrogate Hydro
5. Grand Hotel
6. Sun Pavilion
7. Municipal Offices
8. Royal Pump Room
9. Harrogate Sub-Area Headquarters
10. Lounge Hall and Harrogate Information Bureau
11. General Post Office
12. Bus Depot and Railway Station

ON Monday next there opens at Harrogate the second British Electrical Power Convention organized under the auspices of a council representing all branches of the electrical industry and some closely-allied industries. The president is Sir Vincent de Ferranti, M.C., M.I.E.E., and the member organizations are the Association of Consulting Engineers (represented by Mr. J. R. Beard, M.Sc.); British Electrical and Allied Industries Research Association (Mr. R. Lee); British Electrical and Allied Manufacturers' Association (Col. B. H. Leeson, O.B.E., T.D.); British Electrical Development Association (Mr. R. A. S. Thwaites, B.Sc.); British Electricity Authority and Area Boards (Sir Henry Self, K.C.B., K.C.M.G., K.B.E., Comp.I.E.E., and Messrs. V. A. Pask, F. W. Lawton, H. J. Randall, S. F. Steward, C.B.E., C. R. King and J. Eccles, C.B.E., B.Sc.); British Refrigeration Association (Mr. E. G. Batt); Cable Makers' Association (Sir John Dalton); Electric Lamp Manufacturers' Association (Mr. W. J. Jones, M.Sc.); Electrical Association for Women (Dame Caroline Haslett, D.B.E.); Electrical Contractors' Association (Mr. L. C. Penwill); Electrical Contractors' Association of Scotland (Major J. L. Drummond, M.C.); Electrical Wholesalers' Federation (Mr. A. B. Wildsmith); Employees' National Committee (Mr. J. F. Wallace); Institution of Electrical Engineers (Mr. C. M. Cock); National Register of Electrical Installation Contractors (Mr. P. V. Hunter, C.B.E.); North of Scotland Hydro-Electric Board (Sir John Erskine, C.B.E., D.L., J.P.); Electricity Undertakings in Northern Ireland (Mr. W. J. McC. Girvan); and the Water-Tube Boilermakers' Association (Mr. K. J. McKillop). The secretary is Mr. J. W. Simpson, O.B.E.

Delegates to the Convention will number some 750 of whom about half are

representatives of the B.E.A. and Electricity Boards. The issue of badges and literature will proceed during Monday at the Royal Hall and in the afternoon the President will officially open an electrical exhibition at the Sun Pavilion (4.30 p.m.). There are ninety exhibitors whose displays are briefly described in this issue. This year the exhibition will be open to the public on one day only (23rd June). A reception by the Mayor and Mayoress of Harrogate is to be held at the Royal Hall on Monday evening followed by a dance.

Opening of Proceedings

Delegates will assemble on Tuesday morning at the Royal Hall for a civic welcome by the Mayor and to hear Sir Vincent de Ferranti deliver his presidential address.

Rotarian visitors are invited to lunch with the Harrogate Rotary Club at the Lounge Hall, Parliament Street.

Sir Henry Self, deputy-chairman (admin.) of the British Electricity Authority, is to present a paper on "The Economics of Electricity Supply" at the afternoon session, and a discussion will follow.

Lady de Ferranti will entertain the lady visitors to tea at the Hotel Majestic, and a mannequin parade has been arranged. Sir Vincent and Lady de Ferranti will hold a reception at the Royal Hall in the evening and dancing will follow.

Wednesday's proceedings begin with the reading of a paper by Mr. L. J. Davies, M.A., B.Sc.(Oxon), A.M.I.E.E., on behalf of the Electric Lamp Manufacturers' Association, the subject being "Advances in Lamps and Lighting." The discussion of the paper will conclude the day's business, the afternoon being devoted to coach tours to Bolton Abbey, Fountains Abbey and York. No evening function is provided for in the programme.

Power plant topics will take up the whole of Thursday morning and afternoon, when the following papers will be read and discussed: "Operation of Power Stations," prepared by the B.E.A. and presented on its behalf by Mr. J. D. Peattie, B.Sc.(Lond.), A.C.G.I., M.I.E.E., deputy chief engineer (generation), B.E.A.; "Boiler Plant—Present and Future," prepared by the Water-Tube Boilermakers' Association and presented by Mr. W. F. Simonson, B.Sc. (Eng.), A.C.G.I., M.I.Mech.E.; and "Large Modern Steam Turbo-generating Plant," prepared by the British Electrical and Allied Manufacturers' Association and presented by Mr. J. T. Moore, B.Sc., A.R.T.C., M.I.E.E., A.M.Inst.C.E., A.M.I.Mech.E., A.M.I.Mar.E.

The customary Convention luncheon organized by the Electrical Association for Women will take place at the Lounge Hall, Parliament Street.

The annual dinner will be held at the Hotel Majestic on Thursday evening. As the number of guests is limited to 400 a simultaneous dance at the Royal Hall is being arranged for the "overflow" and the dinner speeches will be relayed to the Hall. Guests from the dinner will join those at the dance later in the evening. A cabaret show will be an attraction.

Proceedings end on Friday morning with a general meeting of delegates at the Royal Hall, but the Yorkshire Electricity Board has extended an invitation to delegates (limited to 90) to take tea at the Board's headquarters, Scarcroft, Leeds, in the afternoon and afterwards visit the new Skelton Grange power station.

Play for the G. P. Dennis Golf Trophy and in a four-ball bogey competition will take place at the links of the Pannal Golf Club during the Convention. The Electrical Industries' Benevolent Association will benefit from these competitions.

Arrangements are being made by the Harrogate Sub-Area of the North Eastern Electricity Board to floodlight a number of the principal buildings and gardens in the town during the period of the Convention.

"ELECTRICAL WHO'S WHO"

Delegates to the British Electrical Power Convention will find the "Electrical Who's Who" of assistance in getting to know more about the people they meet at Harrogate. Copies can be obtained from the *Electrical Review*, Dorset House, Stamford Street, London, S.E.1. or from booksellers at 12s. 6d., plus 7d. postage.

The Convention Terrain

What Delegates May See in the Harrogate Sub-Area

By W. K. FLEMING,
M.I.E.E., A.M.I.Mech.E.*

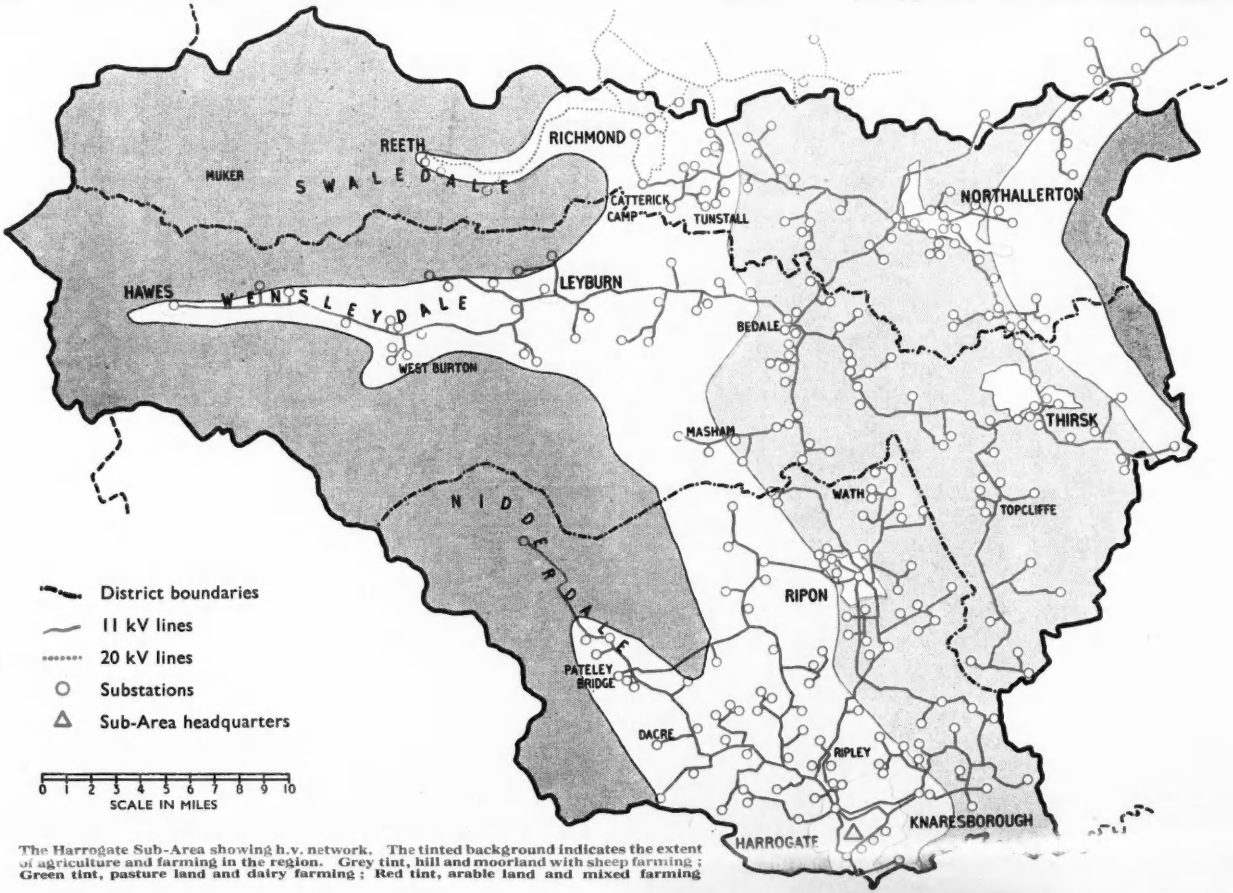
THE Harrogate Sub-Area of the North Eastern Electricity Board has an area of 1,060 sq miles; it extends from the Cleveland and Hambledon Hills in the east to Hawes in the west, and from Richmond in the north to Harrogate and Knaresborough in the south. The western half consists largely of hill country, intersected by the three main valleys of Swaledale, Wensleydale and Nidderdale; these valleys open out in the east to form the fertile plain known as the Vale of Mowbray where the principal towns are Northallerton, Thirsk, Bedale and Ripon.

The Sub-Area is divided into three Districts for administrative purposes, with centres at Harrogate, Thirsk and Northallerton. The district organization is of the "double-headed" type, with a district engineer in charge of local engineering matters and a district commercial officer responsible for consumer service. The Harrogate District of approximately 300 sq miles is the area previously supplied by Harrogate Corporation. Almost the whole of the Thirsk District of 455 sq miles and the Northallerton District (305 sq miles) were part of the area of the former North Eastern Electric Supply Co. Other undertakings acquired were the Hawes Electric Lighting Co. (Thirsk district), Richmond Corporation undertaking (Northallerton district) and the Askrigg and Reeth Electric Supply Co. (Thirsk and Northallerton districts). A number of non-statutory undertakings in Wensleydale and Swaledale have also been taken over.

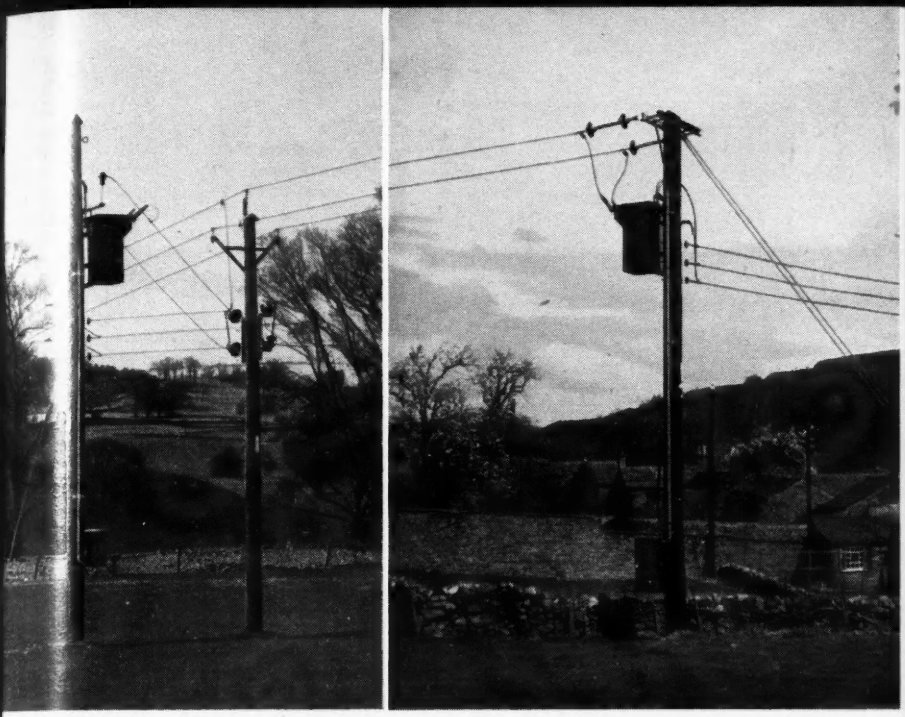
The Harrogate Sub-Area organization for the engineering, commercial, accountancy and secretary's departments has

* Mr. Fleming is manager of the Harrogate Sub-Area of the North Eastern Electricity Board. He was formerly borough electrical engineer of Scarborough.

Above: West Burton, a charming Wensleydale village. Amenities preserved by siting l.v. poles behind the houses. The tops of one or two poles can be seen behind the Village Cross



The Harrogate Sub-Area showing h.v. network. The tinted background indicates the extent of agriculture and farming in the region. Grey tint, hill and moorland with sheep farming; Green tint, pasture land and dairy farming; Red tint, arable land and mixed farming



Left: 50 kVA, 11,000/508-254 V transformer mounted on laypole. Live line taps used to connect to ·1 sq inch main line, of unearthed construction. Right: 50 kVA 11,000/508-254 V pole mounted transformer on terminal pole of light construction spur line

been established for some time at headquarters in Harrogate. A lease was obtained of the Spa Hotel, King's Road (centrally situated, opposite the Royal Hall), and these premises now accommodate all the headquarters staff, as well as certain parts of the Harrogate District staff. The billing of accounts and the meter reading and prepayment meter collection administration for the whole of the Sub-Area are centralized at these offices.

Bulk supplies to the Sub-Area are brought in at three main points—Harrogate, Northallerton and Catterick. The Harrogate generating station has a total installed capacity of 15,875 kW, and was a selected station in the Central Electricity Board's Mid-East England Scheme. It is connected by a 66 kV double-circuit overhead transmission line with the Kirkstall station, Leeds. The station is still generating, and is, of course, now administered by the North Eastern Division of the B.E.A. At the Harrogate station there are two 10,000 kVA 66/11 kV bulk supply transformers; these will be replaced shortly by two 30,000 kVA units.

The Northallerton substation is supplied from Darlington power station by a double-circuit 33 kV overhead line with transformers stepping down to 11 kV. At Catterick substation there are incoming lines from the North Tees station at 66 kV and 20 kV, with transformers again stepping down to 11 kV.

The distribution network in the Sub-Area is mainly 11 kV except for a small amount of 20 kV in the vicinity of Richmond. There are 713 substations, 555 miles of high-voltage overhead lines and cables, and 447 miles of low-voltage overhead and underground distribution. The maximum demand for the Sub-Area is some 33,000 kVA.

Plans have been prepared for the interconnection of the high-voltage networks which were operated separately in the three districts before vesting day; this interconnection will improve flexibility of

operation and reduce the time of interruptions throughout the Sub-Area.

Harrogate is rightly regarded as one of the foremost health resorts in the country and, indeed, in the world. The Royal Baths, where the waters are available, is a centre of modern physio-therapeutic treatments in connection with which electricity is used extensively.

It was Mr. George Wilkinson, a contemporary of notable consulting engineers in the early pioneering days of electricity supply, who prepared a report on "Electric Light" in 1892 for the Borough of Harrogate. Mr. Wilkinson became the first borough electrical engineer, and continued in that capacity until he retired 23 years ago. He was keenly interested in domestic and commercial applications of electricity supply and was responsible for much interesting experimental and inventive work. To-day, at 87 years of age, he still continues his researches.

Supply was commenced in Harrogate in 1897 with a plant capacity of 275 kW and a pressure of 2,000 V, single-phase, 50 c/s, for generation and transmission. The selection of periodicity was a happy one in view of later developments. The 2,000 V system was admirably suited to the conditions, as each hotel, residence or group of properties had its 2,000/200-100 V dry type transformer in a cellar, outhouse, or compact street pillar. Some 275 of these transformers are still in use; they have an aggregate capacity of 10,600 kVA and vary in size from [illegible] to 250 kVA.

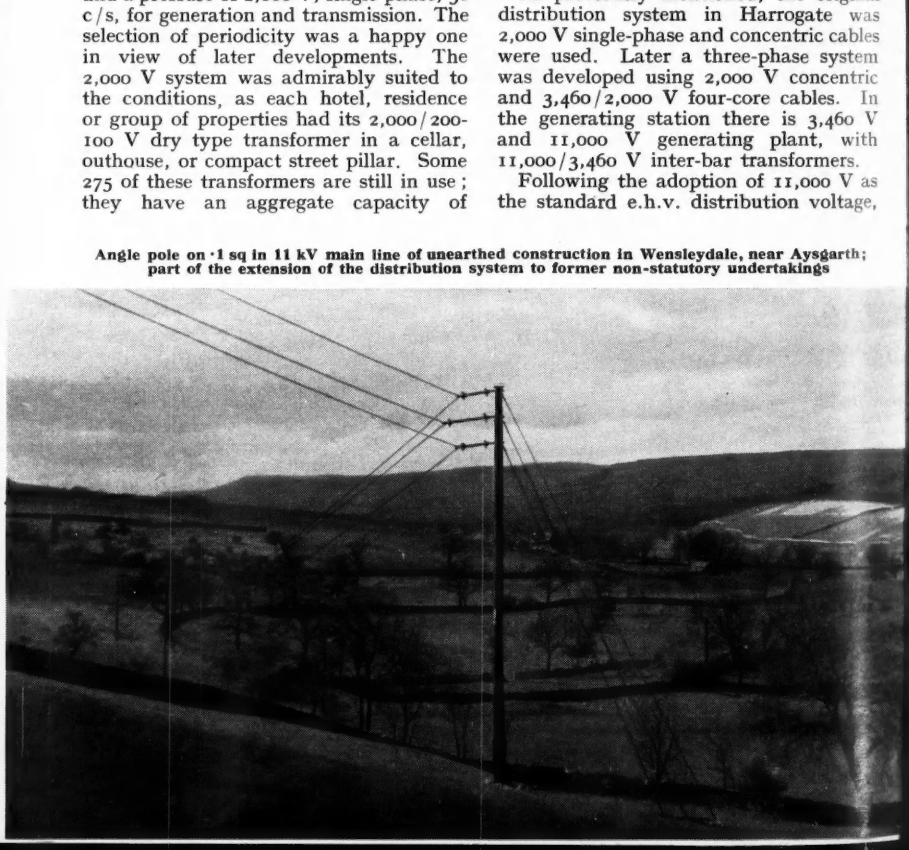
An early improvement was to reinf[illegible]rce the original single-phase distribution [illegible] a three-phase 3,460/2,000 V four-wire [illegible]ys-tem. Many of the original cables [illegible]nd transformers are still giving efficient [illegible]nd trouble-free service despite their ag[illegible] of 50 years or so. In 1929, 11 kV genera[illegible]on and distribution was introduced and [illegible]all subsequent development on the distri[illegible]u-tion side, including considerable rural [illegible]x-tensions, have been carried out at [illegible]his voltage. There are now about t[illegible]ree hundred 11 kV distribution transforn[illegible]rs connected to the Harrogate District [illegible]ys-tem in addition to 15 network tra[illegible]ns-formers which serve to reinforce [illegible]he 3,460/2,000 V system; the aggreg[illegible]te capacity is about 40,000 kVA.

In the years following the introduction of the supply in 1897 the Area was considerably extended and eventually Harrogate took over the Knaresborough and Ripon undertakings.

As previously mentioned, the original distribution system in Harrogate was 2,000 V single-phase and concentric cables were used. Later a three-phase system was developed using 2,000 V concentric and 3,460/2,000 V four-core cables. In the generating station there is 3,460 V and 11,000 V generating plant, with 11,000/3,460 V inter-bar transformers.

Following the adoption of 11,000 V as the standard e.h.v. distribution voltage,

Angle pole on ·1 sq in 11 kV main line of unearthed construction in Wensleydale, near Aysgarth; part of the extension of the distribution system to former non-statutory undertakings



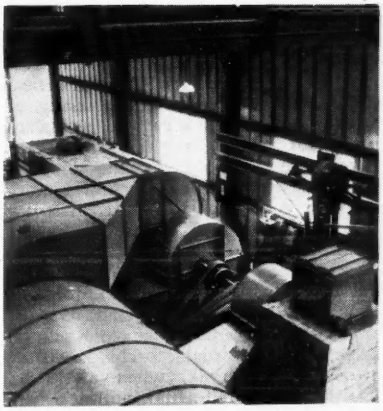
the 2,000 V load was decentralized, and 11,000 3,460-2,000 V transformers were introduced at a number of points in the town each supplying a comparatively small section of the 2,000 V system. About 60 per cent of the 2,000 V load, however, is still supplied from the generating station 3,460 V busbars.

About 18,000 consumers in Harrogate are supplied at 200 V; standardization to 240 V is, therefore, a work of considerable magnitude. The North Eastern Electricity Board has a plan to complete the change over in a few years, but the commencement of the scheme has been deferred due to the Government's request for restriction of capital expenditure. In the remainder of the Harrogate District supplies are at 230 V and standardization to 240 V presents little difficulty. Standardization has already been carried out in the Thirsk and Northallerton Districts.

Among the non-statutory undertakings taken over by the British Electricity Authority, six were in the Harrogate Sub-Area. They were the undertakings of Aysgarth, Bainbridge, Carperby, Thornton Rust and West Burton in Wensleydale, and Muker in Swaledale. It was found that all of them were inadequate and the North Eastern Board decided to extend its 11 kV distribution system 13 miles along Wensleydale as far as Hawes so that all the Wensleydale non-statutory undertakings, as well as the statutory undertakings of Askrigg and Hawes could be supplied. This work has been completed and the small generating stations have been closed down. New distribution networks have been erected in the villages previously supplied by the non-statutory undertakings, consumers' installations have been re-wired where necessary, and apparatus changed over from various d.c. voltages to 240 V a.c. The generating station of the former non-statutory undertaking at Muker in Swaledale is still being operated by the Board. An extension of eight miles of high-voltage line from Reeth along the dale will be necessary before it can be closed.

Although the Sub-Area is predominantly rural and agricultural, there are a number of light industries of a varied nature.

In Harrogate, at the works of Octavius Atkinson & Sons, Ltd., standardized steel-framed buildings are built. Carefully designed and standardized parts are fabricated and made into buildings. The harbour installation at Marseilles has steel-framed buildings from this factory.



A large grain and grass drying plant at Howe, Thirsk, showing the fans and air ducts

Bintex, Ltd., of Pannal, Harrogate, are manufacturers of latex foam ("Dunlopillo") upholstery material, which is used for many purposes. It is made directly from latex, the "milk" of the rubber tree.

In 1923 a small weaving shed was set up in the southern district of Harrogate. The project prospered, and although small in comparison with the great mills of the West Riding and South Lancashire, the Harrogate factory of the Oatlands Weaving Co. is exporting to Canada, South Africa, Australia, New Zealand and Scandinavia as the main customers. Haircloth interlinings are the main product of the factory, which has an output of 35,000yd of cloth per week. There are 124 looms of the high-speed Lancashire type in operation, driven in small groups by 5 to 7½ h.p. electric motors.

The ancient city of Ripon is the home of the manufacture of varnish in this country. The secret of its production was brought to the city by a refugee from the French Revolution in the eighteenth century. He was befriended by a local banker, Daniel Williamson, who founded in 1775 the present-day business of T. & R. Williamson, Ltd., varnish and

paint manufacturers. This company makes over fifty varieties of varnishes which are used in 200 different trades, including the manufacture of electrical insulations; a considerable quantity of varnish is also made for the linoleum industry. A total of 105 h.p. of electric motors are installed in the factory. Another large varnish and paint factory at Ripon is that of Robert Kearsley & Co., where 705 h.p. of electric motors are installed.

During the last war, five million yards of parachute cord and 120 tons of camouflage netting were made at the works of Thomas Gill & Sons, Summerbridge, in Nidderdale. This industry dates back to 1793, when a certain Charles Gill entered a flax mill at Dacre Banks and soon showed a remarkable capacity for mechanical invention. He invented the tow card, and later the "porcupine" or "Rotary Gill" and the "Gill." Hemp spinning was commenced in 1868, and in 1891 electric light was introduced in Nidderdale from the factory plant; the power of the Nidd was used to drive a 25 h.p. water turbine. The mill is still run by the Gill family; it is now served from the public supply mains and is largely electrified with individual motor drives having an installed capacity of 227 h.p. There are several other mills in Nidderdale where jute and hemp spinning is carried on.

During the eighteenth century, yarn was brought from Ghent to Stockton or Yarm-on-Tees and transported by packhorse to North Yorkshire villages, where hand-loom weaving in the cottages was carried on. The yarn was provided by a factor, who paid the weavers for the finished cloth. A John Pattison was engaged in this work in 1790, and he founded the present firm of William & John Pattison, Ltd., linen manufacturers, at Brompton, Northallerton. The principal products of the mill are linen suitings for tropical wear, ladies' dress cloths, and fancy canvas for the shoe trade.

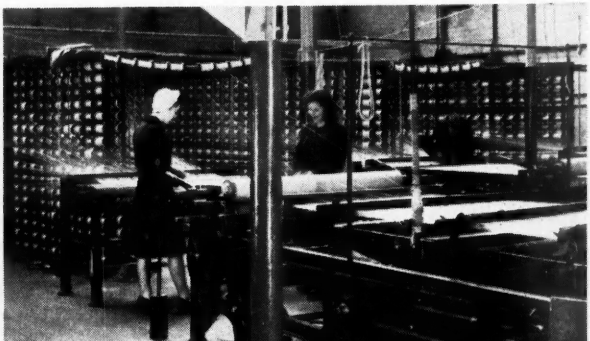
The Castle Mill of Walton & Co., Ltd., Knaresborough, established in 1785, is the oldest of its kind in England. It produces very fine household linens.

At the old-established business of Walker's Tanneries, Ltd., Northallerton, the old pit method of pure oak bark tanning is used. The bark is broken down into one-inch sections in electrically operated mills. It is then put into leaches (a type of pit) after which the liquid tannin is extracted and put into the tanning pits together with the raw hides. Production is at the rate of several thousand hides per annum. At the Bridge Mills of J. Mason, Knaresborough, sheepskin rugs are manufactured complete from the raw hides.

The modern works of James Coombes & Co., Ltd., at Harrogate, are the headquarters of one of the largest multiple footwear repair concerns in the country. Electrically driven machines in the factory cut soles and heels from the bends of leather, a method of cutting which results in a considerable saving of material. Each year three million soles and heels are dispatched annually to over 200 repair factories and shops of the company in all parts of the country.

At the factories of Earnshaw, Ltd., Northallerton, colour finishes for the leather trade are made. Aqueous pigment finishes are manufactured for the

In the linen mill of William and John Pattison, Ltd., Northallerton



finishing of shoe-upper leathers, and nitro-cellulose finishes for fancy leathers.

Trees still abound in the Dales, and saw-milling is carried on extensively. Transportable sawmills move from place to place as the required timber becomes available for felling. At Northallerton this old timber industry serves one of the newest, for there is produced here from wood waste, at the factory of the Rothervale Manufacturing Co., great quantities of wood flour for the plastics industry.

Peter Wilkinson & Sons (Dacre), Ltd., in Nidderdale, have testified to the immense development in the scope of their timber and sawmilling business since the public electricity supply superseded their water supply in 1939. The firm has specialized for a long time in the manufacture of railway equipment and wood turnery, and now has an output of 5,000 railway keys and 100,000 railway ferrules per week. Electrification has helped to develop the manufacture of commercial vehicle bodies and general joinery.

Wensleydale is the home of the famous cheese of that name. At the modern Coverham Dairy cheese factory near Middleham, thousands of gallons are dealt with each day, and production will be doubled when extensions now proceeding are completed. Electricity is used for the brine and refrigerating plants.

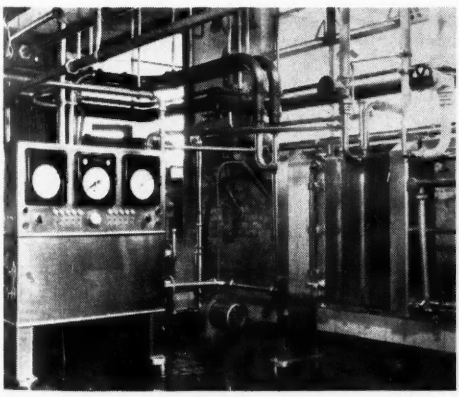
At the factory of the Express Dairy Co., Ltd., Leyburn, a fleet of lorries visit 1,200 farms to collect 25,000 gallons of milk daily. The milk is chilled in the factory and delivered direct from the cooling plant at the rate of 3,000 gallons per hour to tankers.

Dried Milk Products, Ltd., Northallerton, collect milk from 1,400 farms over a radius of 50 miles and at their factory this goes through various processes. Some of the milk is pasteurized and sent in churns to dairymen in the northern region, and a proportion is bottled for dairymen in special areas. A large manufacturing plant makes milk powders for the Ministry of Food, and the well-known "Cow and Gate" food is also made here. Altogether the factory deals with 25,000 to 35,000 gallons of milk per day according to the season of the year.

In an area of so much agricultural activity it is not surprising to find provision for meeting the equipment side of the industry. The firm of Bamletts at Thirsk are well known for their manufacture of agricultural machinery, and employ 300 workers for the purpose. Much of their output is for export at present. Agricultural equipment is also made at Boroughbridge.

The large military camp at Catterick in the north of the Sub-Area is well known to the many thousands of men who passed through it in the two last wars. A new N.A.A.F.I. Club Hostel was opened last year by the Princess Royal, and it is equipped and furnished on a magnificent scale with 44 bedrooms, 8 bathrooms, a private dining room, a public dining room, tap room and numerous games and writing rooms. The kitchen is all-electric, and the 100 kW of equipment includes a fish fryer, a 10 kW oven and grill toaster, a double-deck pastry oven and four 12 kW cooking ranges. Various motors are used elsewhere in the building.

At the factory of Dried Milk Products, Ltd., Northallerton. High temperature milk pasteurizer



Rural Electrification

The farms in the Sub-Area are as varied as the terrain. In Nidderdale, the southernmost valley, the holdings are small, the majority being between 10 and 60 acres; they are devoted almost entirely to dairy farming, and the average size of the herd is twelve to fifteen cows. In Wensleydale and Swaledale, the farms on the

N.A.A.F.I. Club Hostel, Catterick Camp. Part of electric kitchen

average are larger and here sheep farming and dairy farming go side by side. In Swaledale, some farms cover an area of 1,000 acres or more, although the majority of this is moorland where the sheep are grazed.

In the Vale of Mowbray, the agricultural land is recognized as being some of the best in the country, and many of the farms are between 200 and 400 acres, devoted chiefly to corn growing and stock raising. Around the main towns, however, there are a number of large farms where milk is produced by herds of 50 or more dairy cows.

Reference has been made already to some of the rural industries, and in addition to these there are quarrying, tileries, flour milling, grass drying, malt roasting and chicken hatcheries. An interesting feature of agricultural development in the Sub-Area has been the number of grain and grass drying plants for which supplies of electricity have been provided in recent years. Some of these plants obtain supplies of grass during the spring and summer from aerodromes in the vicinity, and in the autumn and early winter confine their activities to grain drying by contract.

There is a ready market for the dried product from the grass drying plant as cattle and poultry feed. Grass drying plants require electric motors totalling 60 h.p. to 100 h.p. and provide a highly advantageous summer and autumn load to the supply authority. When the grass is growing at its greatest rate, the plant may operate 24 hours per day.

With the increased use of combine harvesters, some form of grain drying is essential and it produces the problem of finding sufficient storage space for the threshed grain. An excellent example of what is perhaps the most satisfactory solution is at Howe, near Thirsk, where there are, in conjunction with the drying plant, a series of concrete storage bins or silos with a capacity of several hundred tons. The grain is partially dried and passed to the silos and from there further drying is carried out over a period of weeks or months.

Good progress has been made in recent years in providing supplies to villages and farms in the Sub-Area. Since vesting day supplies have been given to 32 villages. Estimates have been approved for supplying 16 more villages in the near future, and preliminary work is in hand for supplies to a further fifteen. A total of 250 villages in the Sub-Area are now supplied. During the past two years 135 farms have been connected to the Board's supply and at present negotiations have been completed for supplies to a further 80; when the latter are connected the total for the Sub-Area will be 995.

Farmers and other country dwellers have not been slow in appreciating the value of electricity. The Board's organization is fully taxed in dealing with the continued expansion of rural electrification in all parts of the Sub-Area. The ever-increasing availability of electricity is one of several influences which are leading steadily to a revival of rural life. Other changes are the development of social and educational activities, the new emphasis on home production, the stronger economic position of the farming industry and the influx of well-educated young men into farming.

Power Convention Exhibition

Electrical Appliances on View at Harrogate

In connection with the British Electrical Power Convention at Harrogate next week, ninety manufacturers are co-operating in producing a comprehensive display of electrical apparatus at the Sun Pavilion, Cornwall Road. The exhibition will be open to delegates daily from 19th to 23rd June, the public being admitted on the last day only

Aidas Electric, Ltd., Sadia Works, Rowdell Road, Northolt. **Stand 66.**—The type U.T.C. 3-gall "Sadia" water heater for under-counter installation in public houses and restaurants is accompanied by prototypes of other new water heaters.

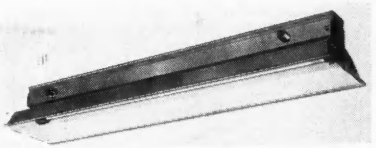
Arrow Electric Switches, Ltd., Hanger Lane, London, W.5. **Stand 90.**—A new a.c. cooker switch is available and many of the q.m. & b. rotary switches have improvements incorporated. New improved heavy-duty tumbler switches, in ranges from 20 to 60 A 250 V, have various types of levers and are in new streamlined pressed-steel boxes. Also shown for the first time are triple-pole q.m. & b. 30 A tumbler switches, a "Wilcolator" thermostat, smaller than previous models, small fractional h.p. motor control switches, self-indicating handles for rotary switches, and small relays.

Automatic Telephone & Electric Co., Ltd., Strowger Works, Liverpool, 7. **Stand 58.**—A "Rythmatic" ripple control installation, to be shipped to Horowhenua, New Zealand, is seen in operation.

Backer Electric Co., Ltd., Fitzwilliam Road, Rotherham. **Stand 38.**—Particular attention is drawn to the speed, reliability and efficiency of the "Backer" radiant tubular boiling plates. Kettle, immersion and industrial heating elements are also shown.

Bastian & Allen, Ltd., Ferndale Terrace, Harrow. **Stand 53.**—Electrode steam boilers (illustrated) shown have outputs from 100 lb to 1,175 lb/hr of steam. Various hot-water boilers are arranged with both handwheel and automatic adjustment of the load. A standard 70 kW boiler demonstrates a new pressure control which varies the load automatically. Auxiliary equipment, wall-mounting non-pressure storage heaters and immersion heater elements are shown.

Bastian & Allen 102,000 B.Th.U/per hour electrode boiler



Benjamin type K "Fluroller" for 4ft tube

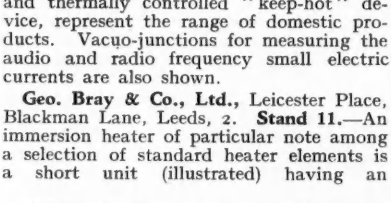
Belling & Co., Ltd., Southbury Road, Enfield. **Stand 17.**—A full range of cookers and household appliances includes a new food-warming cabinet fitted with glass doors and back, for snack bars, etc. The various cookers displayed include the 46 and 47 models, and the "Baby Belling" as well as the 64 AB streamline cooker fitted with wheels to facilitate cleaning.

Benjamin Electric, Ltd., Brantwood Road, London, N.17. **Stand 56.**—A special feature is made of the "Crysteel" vitreous enamel finish used for the company's industrial and commercial lighting fittings. Among "Fluroliers" for fluorescent lighting, prominence is given to the "R.L.M." reflector and two new fittings, the type "H" twin 5ft unit, having continuous channelling features, and the type "K" (illustrated) taking a 4 ft 40 W lamp.

Berry's Electric, Ltd., Touchbutton House, Newman Street, London, W.1. **Stand 68.**—The "New Look" (flat-backed and flush fitting) 1½-gall storage water heater is shown in pastel blue, pastel green, cream and white. In addition there are immersion heaters of both withdrawable and embedded element types.

Best Products, Ltd., Felix Works, Felixstowe. **Stand 3.**—A 3½-pint electric kettle, automatic and non-automatic kettle elements in various loadings, 2-pint and 4-pint electric jugs, and a 2½-pint coffee percolator with instantaneous percolation, and thermally controlled "keep-hot" device, represent the range of domestic products. Vacuo-junctions for measuring the audio and radio frequency small electric currents are also shown.

Geo. Bray & Co., Ltd., Leicester Place, Blackman Lane, Leeds, 2. **Stand 11.**—An immersion heater of particular note among a selection of standard heater elements is a short unit (illustrated) having an



This 2 kW immersion heater produced by Geo. Bray & Co., Ltd., is only 11-in long

immersed length of 11½in and a loading of 2 kW complete with integral thermostats. Refractory and steatite insulators and standard strip, ring and sheathed wire-type elements are also shown.

British Electrical & Allied Manufacturers' Association, 36-38, Kingsway, London, W.C.2. **Stand 78.**—This stand will serve as an inquiry bureau. The B.E.A.M.A. catalogue is available for inspection.

British Electrical Development Association, 2, Savoy Hill, London, W.C.2. **Stand 79.**—An effective display incorporating an open filing cabinet indicates the wide scope of the Association's activities.

British Electricity Authority, British Electricity House, Great Portland Street, London, W.1. **Stand 77.**—Photographs show the progress achieved in the Authority's programme for constructing thirty-eight new power stations. An animated display panel demonstrates the transmission of electricity from power station to consumer.

British Insulated Callender's Cables, Ltd., Norfolk House, Norfolk Street, London, W.C.2. **Stand 64.**—Recent developments in cable design and cable installation technique are typified. Aluminium-sheathed l.v. cables now available in a range of sizes and types in lengths of up to 440 yards, are shown supported on new aluminium alloy claw-type cable cleats designed for simple and flexible erection. An l.v. substation panel exemplifies the wipe-jointing of aluminium-sheathed cables.

British National Electrics, Ltd., Newarthill, Motherwell. **Stand 83.**—The C.49 cooker is demonstrated by an animated model which automatically lifts the hob and opens and closes the hot-cupboard and oven doors and the utensil drawer. Around the walls of the stand panels illustrate uses of water heaters and space-heating equipment.

British Refrigeration Association, 1, Lincoln's Inn Fields, London, W.C.2. **Stand 32.**—A display by members of the Association includes a 4½ cu ft household cabinet and a 15 cu ft all-steel commercial refrigerator by Frigidaire, Ltd.; 3.1 cu ft and 4½ cu ft domestic refrigerators and a new 18 cu ft service cabinet by Kelvinator, Ltd.; a 3.1 cu ft "Fridgette" table-top refrigerator and a 5.3 cu ft domestic refrigerator both with a new "Marco" hermetically sealed system, and the "Carlton" 16.3 cu ft commercial refrigerator by Marco Refrigerators; and 3.1 cu ft and 4.89 cu ft domestic refrigerators and a 15 cu ft service cabinet by the Pressed Steel Co.

British Thomson-Houston Co., Ltd., Crown House, Aldwych, London, W.C.2. **Stand 42.**—New lamps displayed include the "Mazda-Mellow" and coloured fluorescent lamps, the "Mazda-Silverlight" coiled-coil filament lamp and the "Mazda" electric discharge mercury vapour (MA/U) lamp designed to operate horizontally without the use of magnetic arc control. General illumination on the stand is provided by two decorative fluorescent lamp fittings. The Mazda "Nine" floodlight and a typical sodium enclosed side-entry street-lighting lantern are both shown in operation. "Series F 1110" fluorescent lamp reflectors, reflectors and blended light units for factories, offices, schools, etc., complete the display.

British Vacuum Cleaner & Engineering Co., Ltd., Goblin Works, Leatherhead. **Stand 63.**—A range of "Goblin" domestic appliances includes vacuum cleaners, a washing machine complete with 14in roller wringer, the "Teasmade" automatic teamaker, the "Lumilarm" bedside companion set, and thermostatically heat-controlled iron and clocks. Attention is also drawn to flue dust removal plant for use in power stations, ash sluicing plant and central dust extraction plant.

Bulpitt & Sons, Ltd., St. George's Works, 132, Icknield Street, Birmingham, 18. **Stand 28.**—Among a range of electrical domestic appliances and ground base hollow-ware are a new two-slice toaster and an electric whistling kettle.

Burco, Ltd., Rose Grove, Burnley. **Stand 2.**—Improved models of the 600, E.650 and

E.840 wash boilers are accompanied by the E.130 porringer boiler and the 217 electrically heated hand-operated washing machine.

Cable Makers' Association, 52, High Holborn, London, W.C.1. **Stand 74.**—This stand forms an inquiry bureau.

Carron Company, Carron, Falkirk. **Stand 87.**—The new "H.2" (two plate) and "H.3" (three plate) (illustrated) cookers include optional extras such as an illuminated indicating switch panel, kettle holders in both cast aluminium handle-resting and base-resting types, a glass panel in the oven door and a kettle switch-plug attachment. Among fires a special feature is made of a new imitation coal effect.

E. K. Cole, Ltd., Southend-on-Sea. **Stand 20.**—In a selection of Ekco-Ensign lighting products emphasis is on colour and the wide choice of lengths of fluorescent tubes now available. Both industrial and decorative type fittings are included. "Thermovent" heaters comprise inset, floor standing and industrial types, in addition to "Thermotubes" in various lengths. The new high-temperature radiant panel heater is also shown.

Crompton Parkinson, Ltd., Crompton House, Aldwych, London, W.C.2. **Stand 49.**—A complete distribution substation exhibited consists of an ARA/2 ring main unit, a "T.A.P." oil-immersed fuse-operated circuit-breaker, a 250 kVA transformer and a medium-voltage distribution kiosk. The ARA/2 ring main unit is a recent development for systems with short-circuit ratings up to 250 MVA at 11 kV. Switchboards with 4in and 6in dials are available in flush or projecting moulded cases. Among "Tong-Test" ammeters exhibited are types developed for use on distribution systems. The Type B1 housing service meter shown has a moulded case of pleasing appearance. A selection of filament and fluorescent lamps and the new "Comet" 150 W reflector spotlight fitting are shown.

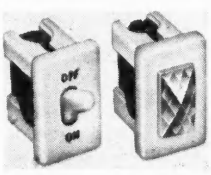
G. P. Dennis, Ltd., Fleming Road, Speke, Liverpool. **Stand 57.**—A typical l.v. substation distribution board incorporates transformer isolating switch units and outgoing fuse distribution units of the latest pattern. New medium-voltage h.r.c. cartridge fuse links are A.S.T.A. certified to A.C.5 (35 MVA at 440 V). Cooker control units are available with either round-pin or pin-fused socket outlets.

"Diamond H" Switches, Ltd., Gunnersbury Avenue, London, W.4. **Stand 25.**—The 1AC series 15 A single-pole 3-heat a.c. cooker switch is cheaper and smaller than the present q.m. & b. type. The similar 2AC multi-circuit series is suitable for many other domestic and industrial appliances. The Type 164A1 12 A a.c. toggle switch and the 7in neon pilot indicator (illustrated) are of similar dimensions and incorporate a novel spring snap-in fixing method. A feature of the 1PD series 35 A q.m. & b. switches is the facility to link the various sections internally. Types 1S and 2S are newcomers to the range of surface-mounting rotary switches and have a capacity of 5-7½ A. A new oven thermostat embodies the latest developments.

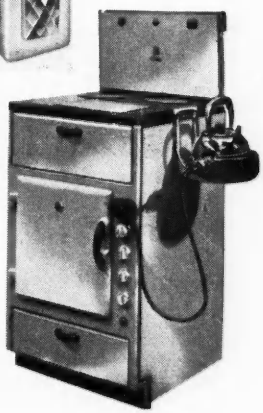
Dorman & Smith, Ltd., Ordsal Electrical Works, Salford. **Stand 9.**—Pictures of switchgear recently installed in the new Palace of Westminster accompany metalclad switches, circuit breakers and lighting fittings. The new "Cumbrian" tumbler switches include flush, surface and semi-recessed types in bronze or ivory finish, together with square and round conduit boxes, etc. D.S. plugs and sockets and cooker control units are also in evidence. British Klockner Switchgear, Ltd., shows motor control gear, push-button starters, contactors, limit switches, etc.

Edison Swan Electric Co., Ltd., 155, Charing Cross Road, London, W.C.2. **Stand 70.**—In addition to a representative display of lamps, items of special interest are a "Portalux" lighting unit, "Ensuralite" emergency lighting equipment, cables, stationary batteries and "Tungar" chargers. The stand is illuminated by "Ediswan" louvred fluorescent fittings in conjunction with "Edispot" reflectors.

Electric Lamp Manufacturers' Association, 2, Savoy Hill, London, W.C.2. **Stand**



Above: Diamond H 12 A a.c. triple pole toggle switch and neon pilot indicator



Right: Carron "H 3" cooker with illuminated switch panel and handy kettle switch-plug attachment

73.—Dioramas showing lighting in a garden, an office and a shop suggest the amenity value of lighting in addition to its more utilitarian uses. A shop window features ideas for lighting development via the showroom. The possibilities of colour lighting are also illustrated.

Electrical Apparatus Co., Ltd., St. Albans. **Stand 21.**—Among house service meters, moving iron and moving coil instruments and motor control gear is the new EHD quarterly type single-phase house service meter, notable features of which are the exceptionally high operating torque and a rotor lifting device for protecting the jewel and pivot during transit. Polyphase and prepayment meters are also shown. The "Motammeter" developed for use on motor control gear where starting peaks up to seven times full load are common, gives an indication of these starting peaks and the full load running current.

Electrical Association for Women, 35, Grosvenor Place, London, S.W.1. **Stand 75.**—A pictorial display illustrates the types of work for which the Association has instituted Certificates and Diplomas.

Electrical Industries Benevolent Association, 32, Old Burlington Street, London, W.1. **Stand 72.**—On this stand some indication is given of the amount of work undertaken for those people in the electrical industry who fall on hard times.

Electro Mechanical Manufacturing Co., Ltd., Marlborough Street, Scarborough. **Stand 84.**—Type "Y" unit construction industrial switch and switchfuse gear can be supplied either singly or in composite units, d.p., t.p., or t.p. and n., in current ratings up to 800 A for switches, and up to 500 A for fused switches. Busbars and chambers are in unit lengths. The switch units are available in weatherproof form.

Elexcel, Ltd., Victor Works, Broad Green, Liverpool, 14. **Stand 59.**—The new "Xcel" cabinet cooker (illustrated) has a drawer incorporated and is available in two-tone ivory or green and cream vitreous enamel. The standard and two table model cookers are also shown, with fires and irons.

Elliott Brothers (London), Ltd., Century Works, Lewisham, London, S.E.13. **Stand 15.**—The Elliott (Shotter-Hawkes) a.c./d.c. comparator has recently been employed for measuring the output of 30 MW alternators. The new series 250 high-sensitivity recorder (illustrated) has a 3in continuous chart, non-spilling syphon pen and two-speed clockwork or synchronous drive. New magnetic materials and advanced design of the movement ensure powerful working forces. Full-scale deflection is obtained for 1 MW. Other instruments on view are a laboratory standard wattmeter; the P.L. wattmeter for industrial use, and a new reflecting dynamometer wattmeter.

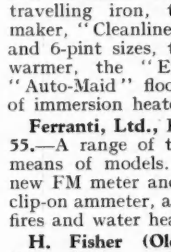
English Electric Co., Ltd., Queen's House, Kingsway, London, W.C.2. **Stand 31.**—Domestic appliances exhibited include a 2009 cabinet-type cooker, which is now fitted with a drawer in the base for the storage of kitchen utensils, a 6.4 cu ft refrigerator, a washing machine, a 2 kW reflector fire, a plate warmer of heat-resisting glass and a food mixer. Domestic meters are represented by a UVS prepayment meter, which can be arranged for single or dual coin operation and with two-part tariff attachment; and the UVE house service meter.

Falco Electrical Appliances, Ltd., Corporation Road, Audenshaw. **Stand 23.**—The improved model 16 cooker has a light-grey mottled vitreous enamel acid-resisting oven interior. The No. 18 cooker, has been specially produced to meet the need for housing schemes.

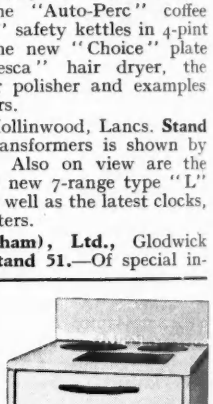
Falk, Stadelmann & Co., Ltd., 91 Farringdon Road, London, E.C.1. **Stand 19.**—Among domestic appliances shown are a new automatic toaster, the "Gad-About" travelling iron, the "Auto-Perc" coffee maker, "Cleanline" safety kettles in 4-pint and 6-pint sizes, the new "Choice" plate warmer, the "Efesca" hair dryer, the "Auto-Maid" floor polisher and examples of immersion heaters.

Ferranti, Ltd., Hollinwood, Lancs. **Stand 55.**—A range of transformers is shown by means of models. Also on view are the new FM meter and new 7-range type "L" clip-on ammeter, as well as the latest clocks, fires and water heaters.

H. Fisher (Oldham), Ltd., Glodwick Road, Oldham. **Stand 51.**—Of special in-



Elliott high sensitivity recorder



Elexcel K 108 cabinet cooker

terest among a range of electric washing machines, drying cabinets and water heaters are the new "De Luxe" model washing machine with heated tub and pump, the small "Washette" type B with drainage hose and the new "Junior" washer, supplied with hand- or power-operated wringer.

General Accessories Co., Ltd., Barton Hill Works, Bristol. **Stand 45.**—Special attention is given to the new "Surrey" 5 A and 15 A a.c. micro-break switches and switch sockets. The fuse of the new "Windsor" 13 A fused plugs can be changed without disturbing the plug assembly. "Clix" cooker control units in black or ivory all have switches of the micro-break type. The company's mobile demonstration unit can be seen close to the exhibition.

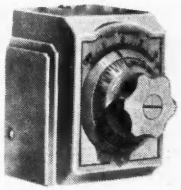
General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2. **Stand 36.**—The new DC.114 domestic cooker available in two-tone ivory or in cream and green retains the modern lines of its predecessor but is of much stronger construction. The DM.305/6 G.E.C. hair dryer can either be held in the hand or used as a table model fixed in a special stand. The DMH.51 refrigerator (5.3 cu ft) has provision for ice making and the storage of frozen foods, together with a "Salador" for keeping salads fresh and a chilling compartment for meat and fish. The DM.370 cleaner, a toaster, coffee percolator, 3-pint kettle, a range of clocks and two fires are also shown.

Gillott Electro-Steam Cookers, Ltd., Cotswold Works, Chalford, nr. Stroud, Glos. **Stand 18.**—In addition to the de luxe model C1 electro-steam cooker in cream there is the new C.20 cooker designed to meet the needs of households which require cooking, steaming and boiling water services without domestic hot water provision.

G.W.B. Electrical Furnaces, Ltd., Dibdale Works, Dudley. **Stand 50.**—A 30 kW "Autolec" continuous steam raiser, a 100 kW fully automatic hot-water boiler and a 100 kW hand-operated boiler are displayed.

Hague & McKenzie, Ltd., Pyramid Works, Sloane Street, Birmingham, 1. **Stand 44.**—"Pyramid" heavy-duty utensils have reinforced sides to give additional strength. Among domestic appliances are a new grill-frypan, an individual pudding steamer and a deep-fat fryer.

Hall & Pickles, Ltd., Port Street, Manchester, 1. **Stand 47.**—An illuminated graphical display demonstrates the operating temperatures of the company's various electrical resistance alloys, which include the "Hydra" 65/15 and 80/20 nickel chromium and "Kanthal" D, A and A.1 operating over a temperature range of 900 deg C to 1,350 deg C. Also displayed



Above: Horstmann auto time control device

Heatrae water heater

are domestic appliance elements incorporating the company's resistance alloys.

L. G. Hawkins & Co., Ltd., 30-35, Drury Lane, London, W.C.2. **Stand 54.**—The "Electric Hostess," the new "Hawkins-Universal" LGH.1220 automatic heat-controlled iron, pressure cookers, hair dryers, kettles, immersion heaters and handlamps are among appliances shown.

Heatrae, Ltd., Norwich. **Stand 37.**—A 1½-gall "D.O.T." water heater (illustrated) forms the centrepiece of this stand, paintings illustrating other types of water heaters including industrial apparatus.

W. T. Henley's Telegraph Works Co., Ltd., 51-53, Hatton Garden, London, E.C.1. **Stand 7.**—A representative range of super-tension cables include gas cushion, oil-filled and mass-impregnated cables. Super-tension terminations and joints and electrical distribution equipment are also represented.

H.M.V. Household Appliances, Hayes, Middlesex. **Stand 52.**—The complete range of domestic electrical appliances displayed comprises portable fires, kettles, coffee percolators, upright and horizontal toasters, controlled heat and travelling irons, hair dryers and room thermostats.

Hoover Ltd., Perivale. **Stand 40.**—Vacuum cleaners include model 612, the heavy-duty model 912, the junior model 375 and the cylinder model 402. The company's washing machine is exhibited and new fractional h.p. motors are also shown.

Horstmann Gear Co., Ltd., Newbridge Works, Bath. **Stand 8.**—H.B.E. electric time switches for street and shop window lighting, two-rate meter control, etc., range from 2.5 A to 50 A capacity a.c. fitted with either synchronous motor-driven, hand-

wound or electrically-wound clock movements. An electrically-wound movement with reserve spring run is also on view. A special time switch embodies two dials and two switch mechanisms. For the automatic control of ovens and other electrical appliances, the auto time control (illus. p. 1189) is available. A geared synchronous motor unit can be supplied with shaft speeds.

Hotpoint Electric Appliance Co., Ltd., Crown House, Aldwych, London, W.C.2. **Stand 82.**—A sectioned model "Perspex" house is fitted with ultra-violet-ray lamps which illuminate the fluorescent domestic hot water and central heating system. Eight circulators and immersion heaters are representative of the company's wide range of equipment. The new H.30 4½ cu ft refrigerator with glass table top is also on show, together with a "Perspex" model of the CF/P washing machine complete with rotary ironer, a table ironer, a portable clothes dryer, a "Junior" cleaner, kettles, irons and a rubber-bladed fan (illustrated).

Jackson Electric Stove Co., Ltd., 143, Sloane Street, London, S.W.1. **Stand 65.**—A representative selection of the 190 series of cookers is seen in colour and with such extra refinements as heated drawers and radiant boiling plates. The "Giant" table cooker is also shown, together with the new "250" thermostatically controlled hot-cupboard. Modified washboilers, models 906 and 907 (the latter with automatic cut-out) have removable interiors and are fitted with new non-clog drain-off taps.

Johnson & Phillips, Ltd., London, S.E.7. **Stand 85.**—A special feature is made of seamless aluminium-sheathed cable.

Walter Kidde Co., Ltd., Bellvue Road, Northolt. **Stand 48.**—Industrial applications of smoke detection apparatus (illus. p. 1193) using the sampling system, are demonstrated.

Landwood Distributing Co., Ltd., 18, Cowcross Street, London, E.C.1. **Stand 29.**—Among publications displayed are "The Ester Purvis Book for All Electric Cookers, Laundrywork, and Household Management," and "Large Scale Cooking by Electricity."

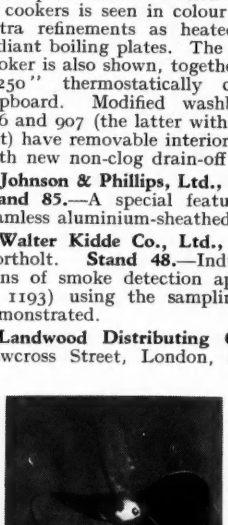
Donald MacPherson & Co., Ltd., 21, Albion Street, Manchester, 1. **Stand 6.**—Applications are shown of the "Foochow" adiabatic aluminium paint which is claimed to withstand constant exposure to 1,000 deg F. The 600 deg F material can also be seen under continuous heat exposure.

Metropolitan-Vickers Electrical Co., Ltd., Mosley Road Works, Trafford Park, Manchester, 17. **Stand 86.**—Remote summation indicating equipment (illustrated) has a double-sided main indicator which can be read at a distance of 60 yd, with a second pointer to advise the boiler house and other interested staff of impending load changes. The 222 stabilized power unit gives 660 to 680 V d.c. (fixed) at up to 250 mA, the maximum drift over 10 min being 4 parts in 100,000 and over one hour, 1.5 parts in 10,000. A power unit giving an output of 200 mA at a voltage infinitely variable from zero to 660 can be fitted if required. Modern street-lighting technique is illustrated by the "S.O. Fifty," "Borough," "Trafford" and "S.S. Fifty-one" lanterns.

Metway Electrical Industries, Ltd., King Street, Brighton, 1. **Stand 12.**—A new range of watertight switch plugs and cable couplings, a new electric kettle are prominent among replacement elements, conduit fittings and flexible tubing.

Nettle Accessories, Ltd., Harper Road, Wythenshawe, Manchester. **Stand 88.**—Prominent among a display of accessories is a 13 A range consisting of flush and surface shuttered socket outlets and fused plugs, with a 13 A flush switch shuttered socket outlet. The parent company, Aerialite, Ltd., shows flexibles and cables.

North Eastern Electricity Board, Carliol House, Newcastle-on-Tyne, and **Yorkshire**



Left: Hotpoint rubber-bladed fan. Below: "Metro-Vick" remote summation indicating equipment

Electricity Board, Wetherby Road, Scarcroft, Leeds. **Stand 76.**—Display panels and information relate to services provided by the Boards. There is an inquiry bureau.

Parnall (Yate), Ltd., 43, Park Street, London, W.1. **Stand 62.**—The EC.6 and EC.12 models incorporate small improvements. A new hydraulic thermostat provides for single-, two- and three-stage variations. A new washing machine of the orthodox agitator type is fitted with a powered wringer and pump.

Philips Electrical, Ltd., Century House, Shaftesbury Avenue, London, W.C.2. **Stand 10.**— A wide range of products covers garage battery chargers, two of the latest portable welding transformers, a special "Dual-purpose" welding plant type giving a.c. or d.c. (rectified) output, electronic instruments lamps and lighting equipment, a new lightweight cycle head lamp and the "Philishave" electric dry shaver.

Premier Electric Heaters, Ltd., Keeley Street and St. Andrew's Road, Birmingham, 9. **Stand 46.**—The latest "Pylon" kettle, the 808 automatic heat-controlled electric iron, and "Hystan" period imitation coal fires are of special interest.

Revo Electric Co., Ltd., Tipton, Staffs. **Stand 30.**—The uew "Peerless" and "Pearl" cookers provide the cooking facilities of a full-sized model, but can be connected to a standard 13A or 15 A plug. There are now five separate models of the "Princess" series of cookers. The "Duchess" cooker incorporates features required by overseas buyers. Other domestic appliances include the "Revomatic" kettle; "Revomatic," "Challenger" and "Portex" irons; fires and tubular heaters; the "Dandy" and "Chef" table cookers; the "Twin" portable boiling table and the new 8in "Aero" fan. Decorative fluorescent fittings and street-lighting fittings are also shown.

A. Reyrolle & Co., Ltd., Hebburn-on-Tyne. **Stand 14.**—A scale model of a 132 kV duplicate-busbar indoor switching station with small-oil-volume circuit-breakers has its various units housed in a three-storey building sectionalized by "Perspex" walls to show the layout. Another interesting exhibit, a typical modern control-board cubicle with instruments and a control-switch of the latest type, contains examples of a new form of cleating for the wiring. The compact new "Reyen" cable used has a coloured layer of fire-resisting lacquer applied directly to the vulcanized rubber and neoprene dielectric. Relays are shown in modern cases.

Rheostatic Co., Ltd., Slough. **Stand 89.** —Thermostats for domestic water heaters, for domestic ovens and for space heating are accompanied by automatic temperature control devices for central heating.

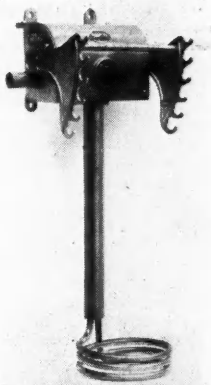
Riley & Neate, Ltd., 45, Jewry Street, Winchester. **Stand 13.**—Besides photographs of the various types of overhead transmission line construction employed, "Perspex" models of the concrete poles show reinforcing rods in position.

Rolls Switches, Ltd., 154, Blackfriars Road, London, S.E.1. **Stand 33.**—Especially long life is claimed for a new switch with only one moving part.

Wm. Sanders & Co. (Wednesbury), Ltd., Falcon Electrical Works, Wednesbury. **Stand 16.**—Heavy industrial, light industrial and domestic equipment include the full range of 13 A sockets and switch sockets and fused plugs, and cooker control units.

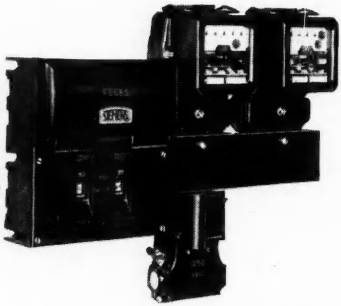
Sangamo Weston, Ltd., Great Cambridge Road, Enfield. **Stand 80.**—With single-phase and polyphase and prepayment meters are portable rotating sub-standard meters for checking house service meters, together with instrument transformers and metering accessories. There is a full range of type SS synchronous time switches; small synchronous motors; laboratory standards; portable panel and switchboard instruments and relays. A new exposure meter is specially designed for use with cine cameras.

Santon, Ltd., Somerton Works, Newport, Mon. **Stand 61.**—Among the new items shown are a fish-frying pan with 12 kW removable elements; a heavy-duty horizontal boiler 12in in diameter and 24in long, with alternative loadings of 30 kW and 90 kW; a 10-pint, 4 kW café boiler for wall mounting, delivering 70 pints of water over one hour; an urn incorporating a new "Sunflower" type of element with built-in automatic cut-out; a pail heater (illustrated) and an automatic water boiler with a new form of control. Immersion heaters include types with a new solid mineral-filled type of element. One of the high-loaded heater plates has a loading of 30 kW.

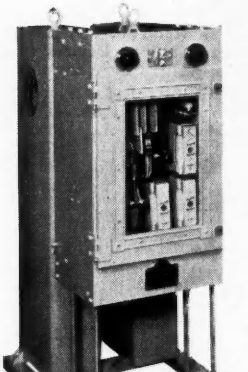


Santon pail heater

Siemens Electric Lamps & Supplies, Ltd., 38-39, Upper Thames Street, London, E.C.4. **Stand 24.** — The "Wilton-Sieray"



Siemens two-piece consumer service unit



Right: Standard Telephones automatic control power factor correction equipment

improved street-lighting lantern for three or four 5ft 80 W "Sieray" fluorescent tubes is accompanied by a new range of "Sieray" fittings with lined "Perspex" diffusers, "Sieray" discharge and tungsten filament lamps, including the new "Silvalux" silica-coated lamp and the 5 kW xenon-filled discharge tube, the "Gas Arc." "Sieflash" tubes are shown for high-speed photography and for use with high-definition stroboscopes. Various arrangements of new all-insulated consumer service units (illus.), house service cut-outs, earth leakage circuit breakers, "Full O'Power" and "Siemax" batteries, a battery-operated "Full O'Power" lantern, and a section of a 33 kV submarine cable are also shown.

Simplex Electric Co., Ltd., Broadwell, Oldbury. **Stand 39.**—Among the latest products are the "Creda Cadet" table cooker on stand, the 10-gall "C.80" wash boiler, restaurant range, and Lundberg 15 A slow-break switches. Also included in the display is an EV.13 cooker with warming drawer, a 1½-gall water heater, an immersion heater, "Halo" iron, cooker control units, a "Prismax Major" bulkhead fitting, a dispersive reflector, "Regent" switch fuses, a h.r.c. distribution board, a flameproof lantern and floodlights.

South Wales Switchgear, Ltd., Blackwood, Mon. **Stand 27.**—The principal exhibits are a pole-mounted transformer and a ring main unit.

Standard Telephones & Cables, Ltd., Connaught House, Aldwych, London, W.C.2. **Stand 4.**—This exhibit comprises power cables, rubber and plastic cables, power factor correction capacitors (illustrated), styrene barrier joints and styrene paper insulation, the "Telecommand" system transmitting routine orders over short distances, alarm annunciation equipment and a "SenTerCel" rectifier.

Sunvic Controls, Ltd., 10, Essex Street, London, W.C.2. **Stand 69.**—The flexible drive of this company's type TO oven thermostat permits complete freedom in cooker design, and simplifies conversion of existing ovens to thermostatic control. The type TQA water heater thermostat is suitable for use with combined immersion or storage water heaters, and also for mounting as a separate unit. "Simmerstats" are shown in various forms.

Thorn Electrical Industries, Ltd., 105-109, Judd Street, London, W.C.1. **Stand 5.**—A miniature stage demonstrates the "Atlas" system of dimmer-controlled fluorescent colour lighting. Fluorescent lighting fittings are accompanied by incandescent lamps and fluorescent lamps in the full range of colours. New accessories for use with the "Mary Ann" food mixer include a small carborundum-wheel grindstone, polishing outfit and juice extractor.

T.M.C.-Harwell (Sales), Ltd., 37, Upper Berkeley Street, London, W.1. **Stand 35.**—Among a greatly increased range of wiring accessories and "Temco" synchronous clocks is a ceiling switch mounted on a 2¼in diameter porcelain base with 2in fixing centres. A display of accessories moulded in white is on show. The wall clock illustrated has a moulded case and a 5¼in dial.

Tricity Cookers, Ltd., 109, Kingsway, London, W.C.2. **Stand 60.**—The "473A Junior" cabinet cooker is, we believe, the

only model loaded below 3 kW in which baking is carried out without the assistance of top heat from the grill. The manufacturers claim that the effective capacity of the oven is greatly increased. The 481 boiling plate and the new 501 warming plate are also on view.

J. H. Tucker & Co., Ltd., Kings Road, Tyseley, Birmingham, 11. **Stand 43.**—The new "Cadet" 30 A cooker control unit (illustrated) measures only 5½in by 6in by 2in deep. A surface-mounting 13 A rectangular pin-type shuttered socket outlet has been developed for use on ring main circuits. Other items are a quiet-action link switch and 5 A and 15 A 3-pin radio interference suppression plugs.

Universal Boilers & Engineering Co., Ltd., Fulledge Works, Burnley. **Stand 26.** The complete "Versco" range of wash boilers and washing machines is on view.

Vactric, Ltd., Newhouse, Motherwell. **Stand 81.**—Special attention is drawn to the mixing, pot scouring, drilling, sanding and new "Multipol" which can be used for polishing. The triple-brush floor polisher R.45 (upright), and the W.101 (cylinder) vacuum cleaners are also shown.

Venner Time Switches, Ltd., Kingston By-pass Road, New Malden. **Stand 1.**—Among a representative display of time switches, prepayment meters and process timers, several of which are demonstrated by working models, are the "ER" synchronous clock movement with 36 hours' auxiliary spring reserve, the "MSDC" time switch suitable for double-circuit street lighting with half-night control, and some of the new lightweight accumulators.

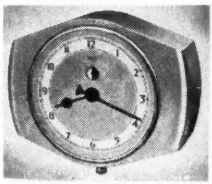
J. & H. Walter, Ltd., 31, John Adam Street, London, W.C.2. **Stand 22.**—With the "No-cord" electric iron and board is the Walter ozonizer.

Wardle Engineering Co., Ltd., Old Trafford, Manchester, 16. **Stand 41.**— "Prismalux" directional lighting fittings are particularly suitable for schools, cinemas, flats, shops, etc. Advantages of "Maxheat" oval tubular heaters are indicated.

Henry Wiggin & Co., Ltd., Wiggin Street, Birmingham, 16. **Stand 34.**—A special feature of this stand is a scale model of the new Ruston & Hornsby gas turbine which employs one of the "Nimonic" series of nickel-chromium alloys for the blades. "Brightray" alloys for resistance and heating elements are represented.

Wilkins & Mitchell, Ltd., Darlaston. **Stand 67.**—The new round model "Servis" washing machine incorporates all the features of the cabinet model but is cheaper.

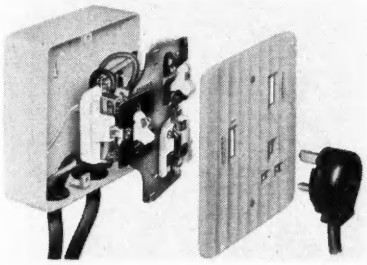
Yorkshire Switchgear & Engineering Co., Ltd., Meanwood, Leeds. **Stand 84.**—A 5-panel switchboard type IVIO represents the company's latest development in metal-clad switchgear equally suitable for service indoors or outside, in ratings from 440 V 2,000 A up to 15 kV 2,000 A and for short circuit breaking capacity ratings of up to 250 MVA. A type IVIO ring-main unit consisting of a standard circuit-breaker unit has two isolatable isolators available in ratings of from 3.3 kV to 11 kV, and up to 250 MVA at the higher voltages.

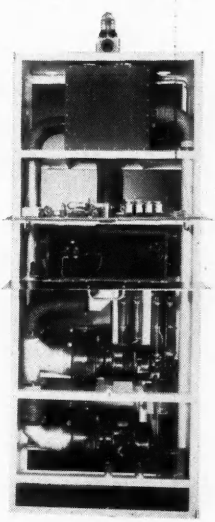


Temco No. 1602 wall clock

Right: Walter Kidde smoke detection apparatus

Below: Tucker "Cadet" cooker control unit





D.C. Transmission

Laboratory Model at Harrogate

POSSIBLE economic merits of the employment of d.c., restricted though its use may be to particular cases, for the transmission of power in bulk over distances exceeding, say, 300 miles, have for some time been under consideration by the Electrical Research Association. To assist this study, the erection of an installation on a pilot scale is contemplated by the joint direct efforts of E.R.A. members.

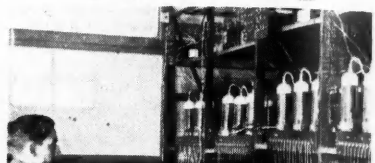
Meanwhile those aspects of the subject which can be investigated theoretically and by small-scale experiment have been studied with the aid of a laboratory model system, prepared in collaboration with Enfield Cables, Ltd., which will be on view (in part only) at the Hotel Majestic in Harrogate during the B.E.P. Convention week.

The model operates at 1,200 V (600 V between each line conductor and earth) and 10 A full load. It is small enough to be almost as flexible as an a.c. network analyzer yet large enough to permit coupling to synchronous machines for studying the stability of a.c. systems to which a large proportion of the power is furnished through a d.c. link.

The questions to be investigated are largely operational, concerning starting, control, protection and stability. The convertor stations (thyratrons in the model) are arranged to represent six single-anode valves in three-phase bridge connection between each line conductor and earth. The transformers are alternately star-star and star-delta while their windings and smoothing reactors are tapped; the transformer reactance of the invertors, which has a bearing on the commutation conditions, can be varied over a wide range.

The grid control of the mains valves (rectifiers and invertors) can be "compounded" to an adjustable extent by the current in the transmission circuit. An electronic tripping circuit, the inertia of which can be adjusted from zero upward, "blocks" the main valves when faults occur and, if desired, the invertor tripping circuit can be linked with the corresponding rectifier which, in an actual scheme, would have to be done by high-frequency pilot links.

The model can represent lines with typical parameters of capacitance and inductance, comprising up to 600 miles of cable and 1,050 miles of overhead line; the first 200 miles of the former is built up of 10-mile units and the first 300 miles of the latter are made up of 30-mile units, as is necessary for the accurate study of the effects of the main harmonics.



Part of the E.R.A. d.c. power transmission system model on view at Harrogate

Investigations with this model have enabled simple means to be suggested (1) for avoiding starting troubles, which prevented one large German pioneer system from being fully loaded, (2) for preventing certain kinds of "hunting," (3) for improving control by taking into account the dynamic conditions during faults in the a.c. network.

Damages Award

AT Chester Assizes damages of £1,295 were awarded to Mrs. Rebecca Jones Huntington, against the Chester Northgate Brewery Co., Ltd., on 2nd June, in respect of the death of her son, James Arthur Jones, last year. A report in the *Liverpool Evening Express* says that in giving the judgment Mr. Justice Cassels said that Jones was working in a copper vat with an electric drill plugged into a lamp pendant. There was a flash and Jones was found dead inside the vat. It was the defendants' duty to Jones to supply him with a drill which complied with a safe system of wiring. This duty had not been carried out.

Commerce and Industry

B.E.A. Insurance Decision
Australian Cable Duty

THE British Electricity Authority has made arrangements to insure the major risks arising from the operation of its undertaking, including fire and such other risks as are normally covered by enterprises engaged in manufacture and trade on a large scale, rather than to carry these risks itself. Through the medium of the British Insurance Association they have negotiated cover with a committee representing the majority of the companies; a share of the cover has been underwritten by Lloyds.

In coming to this decision, the Authority took into account representations which were made to it that the loss of a substantial block of home premium might reduce the prestige and competitive power of the British insurance industry in the foreign market. It also considers the saving which would result; the carrying of its own risks would have necessitated a specialist staff. The majority of the Electricity Boards are also party to the arrangements.

Franco-German Plan

At the same time as M. Schuman was elaborating his plan for the organization of Western European coal and steel industries, important changes in the economic structure of the Saar was being prepared under a plan to cost 40 milliard francs. Within the framework of this plan, an electric power plant will be constructed near to a coal mine to be sunk between Homburg and Neunkirchen. The initial capacity will be 100,000 kW, which will later be increased to 300,000 kW. This plant is considered both by the French and Saarlanders as an important element in Franco-German understanding, for it is expected that power from it will be transmitted as far as Paris and Cologne.

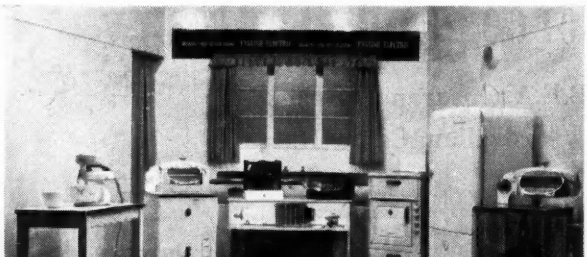
Australian Cable Duty

The *Board of Trade Journal* reports that the question of what rate of import duty should be imposed on covered cable and wire has been referred to the Australian Tariff Board for inquiry and report. United Kingdom trade associations or firms wishing to present evidence at the inquiry should communicate immediately with the Board of Trade Commercial Relations and Exports Department Thames House (North), Millbank, S.W.1, quoting the reference C.R.E. 6863/50. At present covered cable and wire, not elsewhere specified, is admitted free of duty from the United Kingdom; the most-favoured-nation and general tariff rates are 12½ per cent *ad valorem*.

Brush Company's Exhibition

The Brush Electrical Engineering Co., Ltd., Loughborough, opened its first standardization exhibition in the company's works on 5th June, which continued for the remainder of the week. In opening the exhibition the general manager of the Brush Co., Mr. J. W. C. Milligan, said that standardization was an important aspect of engineering. A great deal of effective work

The standardization exhibition arranged by the Brush Electrical Engineering Co., Ltd.,



Display of English Electric Co.'s domestic appliances at the district showrooms, Wolverhampton, of the Midlands Electricity Board

was done by the Standardization Committee, but if standardization was really to be carried out, every employee must help.

New Television Transmitters

Six low-power transmitters have been ordered by the B.B.C. for the Television Service from Marconi's Wireless Telegraph Co., Ltd. They are three 5 kW vision and three 2 kW sound transmitters, one of each forming a complete low-power television station.

M.E.B. Conference

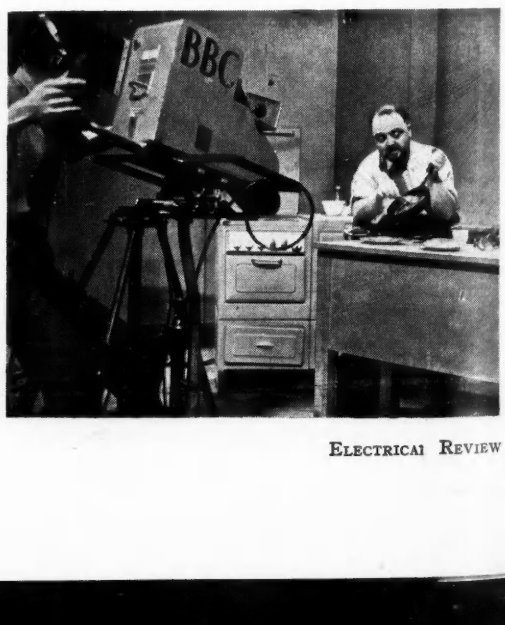
A four-day conference of commercial officers and showroom officials was held recently at the Midlands Electricity Board's district showrooms at Wolverhampton. A feature of the conference was a special display of domestic appliances arranged in collaboration with the English Electric Co., Ltd. Mr. H. J. Gibson, commercial manager of the Midlands Board, opened the display. He said that the rate of increase of load was slackening off, and he suggested that this might well be made up by increased consumption on the domestic side. Members of the English Electric Co.'s domestic appliance staff, including representatives of the Design Department, lectured on the basic principles of domestic appliance design; the principal selling features of apparatus; and the supporting publicity campaigns.

Rubber Research

A rubber research centre was opened recently at Fort Dunlop by Sir Lawrence Bragg, Cavendish Professor of Experimental Physics at Cambridge University. The new centre is the general research headquarters for Dunlop's home and overseas factories. Its main fabric was the wartime headquarters of the shadow factory making Spitfires and Lancasters. To-day, the buildings, standing in two acres of an eight-acre site, comprise 154,000 sq ft of floor space, including fifty laboratories. There is a total technical staff of 276. Sir Lawrence Bragg was welcomed by Sir Clive Baillieu, chairman of Dunlops.

Televised Electric Cooking

A specially designed electric cooker is now installed at Alexandra Palace for use in the television cookery demonstrations. Hitherto gas cookers were usually used in these programmes but now both methods of cooking will be shown to viewers. Mr. Philip Harben, the television chef, in consultation with E.D.A., inspected a number of electric cookers before deciding on one for use at Alexandra Palace. For the purposes of television a down-dropping oven



Mr. P. Harben giving a demonstration with an electric cooker to television viewers

door is required, to enable the camera to come in from either side, while switches all on one level make it easier for the viewer to follow the demonstrator's hand. Rapid boiling plates are fitted and the cooker has two ovens.

Thorn-Philco Agreement

Mr. Jules Thorn, chairman and managing director of Thorn Electrical Industries, Ltd., who has just arrived back in England from a visit to the United States, announces the conclusion of an agreement with Philco Corporation of Philadelphia which will result in close technical and manufacturing co-operation between the two companies in the radio and television fields. In addition to their established line of Ferguson radio and television receivers, Thorn Electrical Industries, Ltd., will manufacture Philco radio and television receivers which will be marketed in the United Kingdom by Philco (Great Britain), Ltd., and in the export markets by Philco Overseas, Ltd.

Power Plant for New Zealand

Last week Mr. W. S. Goosman, Minister of Works of New Zealand, stated that three contracts worth altogether about £1,000,000 had been placed, the largest having gone to the Metropolitan-Vickers Electrical Co., Ltd., and the others to the Dominion Engineering Co., Canada, and to Ferranti, Ltd. The first two relate to equipment for the new Whakamaru power station on the Waikato river, in the North Island, the M.V. contract being for the hydro-electric generators, and that of the Dominion Engineering Co. for the water turbines. The M.V. tender was for four 27,777 kVA generators to run at 136 r.p.m. and generate at 11 kV.

Ferranti, Ltd., have received an order from the State Hydro Electric Department, New Zealand, for thirteen generator transformers to be installed at Roxburgh (South Island) for stepping up voltage for 11 kV to 220 kV. These transformers, single-phase, 14,800 kVA, form four 3-phase, 44,400 kVA banks, with one spare single-phase unit. H.v. windings are arranged for series-parallel connection for 110,000 or 220,000 V. Cooling is type O.F.W. with separate water-cooled oil coolers.

Transformers for Skelton Grange

The first of the three Hackbridge 70 MVA, three-phase type OFW, 11/134 kV main generator transformers was recently transported from the company's works to the new Skelton Grange power station (B.E.A. Yorkshire Division). These transformers have the unusual feature of cable boxes for the 134 kV outgoing connections, instead of h.v. porcelain bushings, but these large h.v. cable boxes, which are mounted from the main transformer cover, were removed during delivery of the transformer to meet transport height restrictions. The weight of each 70 MVA transformer, stripped for transport, is approximately 96 tons, while its weight installed at site, complete with on-load tap changing equipment, water coolers and oil pumps will be approximately 117 tons.

Mobile Agricultural Exhibits

The Electrical Development Association's experimental prototype pair of mobile electro-agricultural exhibit units are now in use. They appeared for the first time at the Cheshire Agricultural Show, Chester, on 7th and 8th June, and formed part of the Merseyside and North Wales Electricity Board's stand. These units will enable the Electricity Boards to attend more shows and similar functions at less cost. One of the units is fitted with horticultural and the other with poultry equipment. Both units are wired ready for connection to a source of supply and are complete with the necessary canvas roofing for an arcade layout, as well as such details as show cards. British railways are co-operating closely in the trial working of this idea during June to September this year, covering 19 shows in five Electricity Board areas. The units were delivered from railhead to the showground at Chester by a British Railways road haulage truck, and it took only 20 minutes from the time of arrival of the units and crane on site to unload. All work of unloading, positioning and opening up the units, erecting the canvas arcade and connecting the supply line to the ring main of the units, took two electricians less than three hours.

Board's Municipal Tenders

At a recent meeting of the Eastbourne Town Council attention was drawn to the South-Eastern Electricity Board's practice of submitting tenders for Corporation installation work based on specifications drawn up by the Board itself. The town clerk and borough surveyor were asked to report on the matter. The *Sussex Daily News* reports that they have told the Council that although such a procedure is unusual and may appear to place the Board in a privileged position, they are of the opinion that, in fact, the Board gains no advantage. Actually it has obtained only about 10 per cent of the work of wiring Council houses. It would be in the Corporation's interests to continue the practice. It is stated that frequently an architect acting for a private client asks an electrical contractor to prepare a specification on

which the contractor subsequently submits a tender. The Board has made no charge for preparing a specification.

New Birmingham Showroom

A new branch showroom has been opened by Jackson Boilers, Ltd., at 202, Corporation Street, Birmingham. The showroom is panelled in walnut and the ceiling is in ivory finish. Pendant lamps giving the effect of water fountains, provide the lighting. At the rear of the showroom is an alcove showing one of the company's latest fountain boilers silhouetted by rose and gold fluorescent and neon lighting, which illuminates the words "The Jackson" on a walnut canopy above. The general office is in blue and cream and there is a spacious basement for stores.

Trade Announcements

A branch office has been opened by **Dewhurst & Partner, Ltd.,** at York House, 21, Park Street, Leeds, 1 (telephone: Leeds 26553), under the control of Mr. M. Woosnam, resident engineer and manager.

J. H. Tucker and Co., Ltd., have appointed Mr. W. D. James to look after their interests in the West of England and South Wales. His address is J. H. Tucker & Co., Ltd., 17, Victoria Road, St. Philip's, Bristol, 2 (Telephone: Bristol 76932).

Books for E.I.B.A. Home

Readers who have any books to spare are asked to send them to the Electrical Industries Benevolent Association home for retired people, Broome Park, Betchworth, Surrey. The home already has a fair library but there is plenty of scope for extension. The residents naturally have different tastes in reading but we are told that encyclopædias are in demand.

Post Office Engineers

Some 450 delegates representing nearly 50,000 members of the Post Office Engineering Union have this week attended the Union's annual conference at Bridlington. In his address on Monday the president, Mr. E. Power (Leeds), referred to the Government's policy of wage restraint. At the outset, he said, together with the majority of trade unions they decided to support this policy, but their attitude had now been reversed. To deny to groups of skilled workers such as theirs, who lagged behind others, the right to have their wages levelled up was unjustifiable.

Non-Ferrous Metals Productivity

A productivity team from the non-ferrous metals industry left for New York on 9th June on the *Queen Elizabeth*. The team is led by Mr. W. F. Brazener, and the members include Mr. W. J. Bannister, of British Insulated Callender's Cables, Ltd., Messrs. J. F. Walker, L. E. Dyer and R. Baldwin, of Enfield Rolling Mills, Ltd., and Messrs. V. B. Hysel and A. Goodwin, of Thos. Bolton & Sons, Ltd.

Coventry Award

In 1941, on account of the high earnings in Coventry factories, workers in the electricity undertaking were given a bonus of 10s a week. The question of the continuance of this payment was raised by the proviso in last year's award of an extra 1½d an hour to electricity supply workers that existing excess payments should merge in the advance, except where special conditions existed. The arbitrator appointed to decide the issue has now reported in favour of the bonus continuing because of the high cost of living in Coventry.

Fulham's Efficiency

Although the 1949 thermal efficiency of the Fulham power station was given correctly, as 26.49 per cent, in a leaderette in our last issue, the figure appeared in the table on p. 1155 as 26.79 per cent.

Zinc Price Increase

The Ministry of Supply has announced that the price of good ordinary brand zinc is increased from 13th June by £4 per ton to £127 10s per ton delivered. Zinc oxide manufacturers also announce that the prices of zinc oxide in lots of not less than two tons delivered buyers' premises are also raised from the same date.

Catalogues and Lists

Babcock & Wilcox, Ltd., Babcock House, Farringdon Street, London, E.C.4.—Folder describing a water-filled ash hopper for pulverized fuel boilers.

Simplex Electric Co., Ltd., Broadwell, Oldbury, Birmingham.—Brochure describing the Z.I.R. (zinc impregnated rustproof) process, its applications and advantages.

Brook Motors, Ltd., Empress Works, Huddersfield.—Technical brochure illustrating the use of Brook motors in the manufacture of Enfield cables.

Birlec, Ltd., Tyburn Road, Erdington, Birmingham, 24.—Two technical brochures on large batch-type heat treatment furnaces and vertical forced-air circulation furnaces.

British Thermostat Co., Ltd., Windmill Road, Sunbury-on-Thames, Middlesex.—Technical folder on the "Teddington" type Q7 pressure control.

Plessey Co., Ltd., Ilford, Essex.—Technical brochure on "Caslite" iron-dust cores.

ELECTRICITY SUPPLY

New Power Stations and Extensions

APPLICATION has been made by the British Electricity Authority for the consent of the Minister of Fuel and Power to the extension of the Portishead generating station by the addition of a new "B" section. This will comprise six 60,000 kW turbo-alternator sets and twelve 300,000 lb/hr boilers, for which purpose an extension of the power station site by 46 acres is proposed.

The consent of the Minister has been obtained to the establishment of new power stations at Fleetwood, Lancs, and Goldington, Bedford, and the extension of the existing Blackburn station. The two new stations will each have an ultimate capacity of 180,000 kW and the first sections covered by the consents will in each case comprise one 30,000 kW turbo-alternator and one 300,000 lb/hr boiler with one cooling tower at Fleetwood and two at Goldington. The Blackburn station extension will comprise one 40,000 kW turbo-alternator, three 150,000 lb/hr boilers and one cooling tower. With the installation of this plant, the total installed capacity of the station will be raised to 150,000 kW.

Generation in May

The monthly statistics published by the Ministry of Fuel and Power show that 4,255 million kWh was generated by the British Electricity Authority, the North of Scotland Hydro-Electric Board and the Lochaber Power Company in May. This compares with 4,310 million in April and 3,850 million in May last year. The rate of increase over last year of 10.5 per cent was very close to the average for the first five months of the current year (10.1 per cent).

There was an increase in the installed capacity of plant during May of 76,000 kW, including 1,000 kW in the North of Scotland. New plant at B.E.A. stations comprised one 30,000 kW English Electric Co. set at West Ham, one 45,000 kW Metrovick set at Cliff Quay, and one 240,000 lb/hr Babcock & Wilcox boiler at Staythorpe. The total installed capacity at the end of the month was 14,243,000 kW.

Malvern Inquiry

The proposal of the Midlands Electricity Board to erect an overhead line across the Malvern Hills was the subject of a public inquiry held last week at Malvern by Mr. A. N. East, of the Ministry of Fuel and Power. The main contention of the seven objectors (the County Councils of Herefordshire and Worcestershire, Malvern U.D.C., Malvern Hills Conservators, the National Trust and two individual landowners) was that the amenities would be spoilt. Mr. J. F. Bourke, for the Electricity Board, said that the route had been selected with care, and took into consideration folds in the hills. The 20,000 people needing electricity in Herefordshire should be considered. The Board had decided it must be ruled in this matter by efficiency, economy and amenity. Impairment of the amenities would be negligible. The cost of overhead lines would be £12,700, compared with £31,600 for underground cables.

	Fuel Consumed Thousand Tons		kWh generated Millions			kWh sent out Millions	Installed capacity (m.c.r.) MW
	Coal	Oil	Steam	Water Power	Total*		
British Electricity Authority ...	2,456	5.0	4,120	26	4,159	3,917	13,864
North of Scotland	16	0.9	22	70	96	95	379
Total for May, 1950	2,472	5.9	4,142	96	4,255	4,012	14,243
Total for May, 1949	2,290	4.6	3,746	88	3,850	3,628	13,326
Increase, per cent	+ 7.9	+ 28.3	+ 10.6	+ 9.1	+ 10.5	+ 10.6	+ 6.9
Total for Jan.-May, 1950	13,564	29.4	22,772	566	23,435	22,132	—
Corresponding total for 1949 ...	12,547	22.6	20,621	577	21,283	20,093	—
Increase or decrease per cent ...	+ 8.1	+30.1	+10.4	− 1.9	+ 10.1	+ 10.1	—

*The total figure includes generation by oil engines, refuse destructors, and waste heat plants amounting to 7.6 million, 0.2 million and 9.5 million kWh, respectively in May, 1950.

FINANCIAL SECTION

Company Notes and Stock Exchange Activities

REPORTS AND DIVIDENDS

W. T. Henley's Telegraph Works Co., Ltd.—Presiding at the annual meeting held on 9th June, Sir Montague Hughman (chairman) said that they had completed the year under review with a record output in volume and a record turnover. The export turnover showed a considerable increase over any other year and the business in the home market, while it represented a slowing down in volume, gave them the opportunity of reducing the large accumulation of orders on their books and to offer more favourable delivery times for new business. Some overseas countries restricted imports, or local conditions made it difficult to export, and a proportion of their sales overseas had been made from local stocks which had not yet been replenished. While their business last year was large at home and abroad there were many factors which they had to face in 1950 which might result in a reduction.

Their research laboratories had had a successful year and they were entrusting to them a number of developments up to the pilot plant stage. They had authorized considerable capital expenditure on such pilot plant during the last year. All the buildings at the new Birtley factory had been completed and production commenced this year on a small scale and they were now engaged in transferring plant and personnel from their small factory to the new one.

Their business in power cables reached record post-war levels and in spite of the serious setback to their export trade in various countries due to rigid controls the tonnage leaving the works exceeded that of 1948 by 10 per cent. Their copper wire mills produced an all time record output, while their engineering works continued to make steady headway. The combined output of the North Woolwich and Birtley rubber cable works showed a slight reduction in mileage over 1948, but the tonnage despatched had increased. The progress reported last year in the contract department continued throughout 1949 and the value of the sales for the year was approximately double that for 1948.

A reasonable profit was made by Henley's (South Africa) Telegraph Works Co., Ltd., but the recession in the demand for tyres resulted in a loss by Henley's Tyre & Rubber Co., Ltd. The mechanization of the foundry of Oakley Brothers, Ltd., was completed during the year and increasing output was being obtained.

Siemens Bros. & Co., Ltd., in the full accounts for the year ended 31st December last, now published, show a consolidated trading profit of £915,077, as compared with £992,536 for 1948, to which is added income from investments of £73,729, profit on realization of investments, £10,235, and exchange profit on conversion of net assets in foreign currencies, £33,753, making a total of £1,032,794.

After meeting £276,895 for taxation, and providing for depreciation, etc., there is a net profit of £514,759 (against £450,423). With £872,929 brought in, £100,069 transferred from taxation provisions not now required, and £83,500 release of over provision for depreciation of fixed assets, the sum available is £1,571,257. Reserves receive £377,462, and the ordinary dividend for the year is again 7½ per cent. The balance carried forward is £915,045.

In their statement to stockholders the directors say that 1949 was marked by the increase of manufacturing output of telecommunication equipment at their West Hartlepool factories. Further plant is in process of being installed. Orders for telecommunication equipment were well maintained and overseas orders again included orders for the motor uniselector type of automatic exchange equipment. The British Post Office has instructed them to proceed with engineering work for the first exchange of that character. Engineering and production facilities for transmission equipment were expanded and orders for marine wireless and other marine equipment were well maintained. The home market demand for power cables was also well maintained, and during the year a 33 kV cable was made and laid across the Solent. A further submarine power cable was made and laid across the Kyles of Bute. There is a shortage of sterling currency, with consequent import restrictions, in many countries and unsettled political conditions abroad have their effect on demand. Nevertheless orders received from overseas were considerable and formed a substantial proportion of the total of orders. Siemens Electric Lamps & Supplies, Ltd., had a successful year and their lamp research laboratories at Preston were fully occupied

on improvements in fluorescent powders and on new types of lamps. A xenon filled "Sieflash" tube has been evolved with an effective duration of flash of the order of one millionth of a second, and a new high brightness lamp has been produced using a high current density discharge through xenon gas giving light of daylight quality. The daylight matching unit has proved very successful. The recent raising of money by the British Electricity Authority should in due course entail a greater demand for cables and accessories.

The Calcutta Electric Supply Corporation, Ltd., held its annual meeting on 7th June. In his statement to shareholders Sir James Donald (chairman) said that their operations during 1949 were affected in more than an ordinary degree by the political and economic conditions which prevailed throughout India. On the whole, however, they had had a successful year, and sales of electricity showed a considerable advance, the total consumption being 728.4 million kWh (against 702.9 million kWh in 1948). The new Cossipore station had now been put in commission. So far, in this station, there were two 30,000 kW sets in operation, but they hoped to commission a third set of 50,000 kW by the end of this year. At Mulajore extensions were progressing satisfactorily and they hoped to have in commission this year two 30,000 kW sets additional to the existing plant, bringing their total generating capacity up to 365,000 kW.

Heatrae, Ltd.—The annual meeting will be held on 28th June. In his statement circulated to shareholders, Mr. C. H. Smith (chairman) says that the explanation of the small deficit on the year's trading is the extortionate rate of purchase tax on electric water-heating apparatus, which has hitherto been their main product. They have extended their activities and their products now include not only electrically heated apparatus, but also apparatus heated by steam and gas. Their orders for export have slightly increased, but development is hampered by the difficulties of obtaining import licences from the Governments concerned, and the general shortage of electric power from which many overseas customers are suffering. The current year has opened with a more satisfactory inflow of orders.

Bakelite, Ltd., reports a consolidated trading profit for 1949 of £200,275, as compared with £247,724 for 1948. After providing £51,542 for taxation, there is a balance of £148,733 (against £147,268), to which is added £28,818 brought in, profit applicable to previous years arising from the revaluation of stock-in-trade, £32,815, and tax reserve not required £10,000, making £220,366. It is proposed to pay a final dividend of 13 per cent, maintaining the distribution at 18 per cent for the year and after making allocations to various reserves, to carry forward £30,464.

Keith Blackman, Ltd., report a profit for the year ended 31st March last of £208,736, as compared with £275,766 for the previous year. Taxation absorbs £110,000 and reserves £64,500. The dividend for the year is 20 per cent (against 20 per cent and a bonus of 5 per cent), and £59,659 is carried forward (against £58,973 brought in).

Ozonair, Ltd., reports a trading profit of £9,866 for 1949, as compared with £10,443 for 1948. The dividend is unchanged at 8¾ per cent, and £3,409 is carried forward (against £3,530 brought in).

Aron Electricity Meter, Ltd., reports a profit before tax for the year ended 31st March last of £59,554, as compared with £44,472 for 1948-49. After deducting tax of £35,078, and adding £4,847, provision for taxation no longer required, and £26,929 brought in, there is a balance available of £56,252. Reserves receive £15,120, and the dividend for the year is unchanged at 15 per cent. The balance carried forward is £28,597.

Worthington-Simpson, Ltd., report a trading profit for 1949 of £432,002, as compared with £378,136 for 1948, and after making various provisions, there is a net balance of £152,644 (against £129,779), to which is added £81,987 brought in and £10,000 taxation over-provided in previous years. General reserve receives £80,000 and the ordinary distribution for the year is maintained at 20 per cent. The balance carried forward is £116,172.

The General Cable Manufacturing Co., Ltd., has declared an interim dividend of 12 per cent (against 20 per cent), on capital of £125,000.

R. A. Lister & Co., Ltd., are paying an interim dividend of 2½ per cent (against 5 per cent) on £2.6 million as increased by a bonus.

BANKRUPTCIES

S. I. Rae, carrying on business at 1, Ashburton Road, Gosforth, electrical contractor.—Trustee, Mr. G. Barr, 135, Sandyford Road, Newcastle-on-Tyne, appointed 6th June.

L. O. Richardson, The Bungalow, Norway Lane, Littlehampton, electrical contractor.—Trustee, Mr. A. E. Orbell, 6 & 7, Old Steine, Brighton, Official Receiver, released 23rd May, 1950.

E. B. Page, carrying on business at 10, & 12, John Street, Hyde, Ches., electrical engineer.—Supplemental dividend of 7½d in the £, payable 16th June at 20, Byrom Street, Manchester.

FINANCIAL SECTION

STOCKS and SHARES

STOCK EXCHANGE markets give indications of robust strength. There is an obviously increased willingness on the part of the public to buy stocks and shares. Prices are on the rise. Improvements—considerable in some cases—have been secured during the past week by a number of issues quoted in our monthly list. Investment attention fastens upon shares in companies which are paying dividends at rates which are substantially below those shown by the earnings and in most cases of this nature the improvement has been marked.

Gilt-Edged Strength

British Electricity 3½ per cent stock, 1976/79, issued at 99 in the early part of May, reached 100¼ last week in the course of an all-round strengthening of prices in the gilt-edged market. Of the two senior 3 per cent Electricity stocks, the 1968/73 issue has improved to 96¼ and the 1974/77 issue to 94¾. Transport 3 per cents, 1978/1988, are a good market at 90½. A funding operation announced by the Treasury pleased the market as evidence of a return to orthodox financial methods, and a further aid to confidence is expected from the coming report on our gold and dollar reserves, a matter to which the gilt-edged market is naturally sensitive. Apart from these comparatively specific considerations, the market seems to be sharing the effects of a generally more optimistic frame of mind in the business world.

Rises on the Week

General Electrics, 82s 6d, and Westinghouse Brake, 60s, stand out with rises of 2s 6d. A gain of 3s 9d in Aron Meters lifted the price to 41s 3d. Hoovers, at 45s 9d, have been rising every week since the increased dividend was announced. E. K. Cole are 2s 6d up at 18s 3d. Amongst other improvements may be mentioned Electric Construction 45s 6d, British Aluminium 40s 9d, Mather & Platt 55s 9d, C. A. Parsons 66s 3d, Thorn Electrical Industries 17s 6d, Midland Electric 55s. Ever Ready recovered 1s 6d to 28s 6d. In the heavy group, Babcock & Wilcox at 62s 6d are 1s 9d to the good.

Anglo-Portuguese Telephone shares were quoted ex rights on Monday in this week; four new were offered for 13 old shares, at 21s. The new are now 4s 9d premium, free of stamp, and the old 25s 6d ex rights. Anglo-American Telegraph stocks maintain their recent firmness at 100½ for the preferred and 19½ for the deferred. Cable & Wireless ordinary at 96¼ has risen 4 points since last week. The 4 per cent loan stock is steady at 101½.

Lancashire Dynamo Capital

At the fifty-first annual meeting of Lancashire Dynamo & Crypto, shareholders were told that the question of replacing temporary loans by additional capital is under consideration. As the chairman pointed out, the present nominal capital of £558,700 compares with total capital and reserves of over £1,900,000 employed in the group. The board does not consider that temporary loans should take the place of permanent capital in the case of an expanding business and taxation is hindering the policy of ploughing back profits on which the business has been built up. The £1 ordinary shares have risen to 97s 6d. The yield at that price is £4 12s 3d per cent on the 22½ per cent dividend, which accounted in cash for less than 1¾ per cent of last year's turnover.

Enfields and Siemens

The prospect of more difficult trading conditions is not likely to impair the reputation of the leading cable manufacturers' shares as being among the most reliable of investments. That conservative handling of good post-war profits has left dividends and balance-sheets remarkably well fortified is evident from the full accounts now available from Enfields and Siemens. Both pay 7½ per cent on their ordinary shares, which stand respectively at 32s 6d and 31s 3d to yield a little either side of 4¾ per cent, Enfields' yield being the lower probably by virtue of the five-fold earnings cover for the dividend, and the absence of overdraft.

A. C. Cossor

A 1/6 rise in A. C. Cossor 5s shares has taken the price to 9s 9d since a week ago. The financial year ended in March, when the company made a statement to the effect that the results will show a profit, though not enough to cover the loss brought forward from the previous year. The financial position had substantially improved, but in order to conserve resources, the 6 per cent preference dividend was again passed. These preference shares are quoted at 17s 9d, and have two years' dividends due to them.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (2s each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1944

5476. British Thomson-Houston Co., Ltd.—Arc furnace control systems. 24th March, 1944. (640633.)

1945

5350. Furse & Co., Ltd., W. J., and Williams, R. G. —Control means for colour lighting apparatus. 1st March, 1946. (640693.)

14732. Metropolitan-Vickers Electrical Co., Ltd., and Waterton, F.—X-ray apparatus. 11th June, 1946. (640694.)

17962. General Electric Co., Ltd., and Campbell, G. C. L. — Frequency-modulated radio transmitters. 14th June, 1949. (640695.)

21537. British Thomson-Houston Co., Ltd.—High-frequency discharge apparatus. 22nd August, 1945. (640823.)

29820. Mullard Radio Valve Co., Ltd., and Keddie, J. E. — Cone diaphragm electro-acoustic apparatus. 22nd December, 1947. (640824.)

34493. Philips Lamps, Ltd. — Velocity-modulated electron-discharge devices. 20th December, 1945. (640697.)

1946

17286. Philips Lamps, Ltd.—Device for extinguishing an electric-discharge tube. 6th June, 1946. (640700.)

22551. British Thomson-Houston Co., Ltd., and Scott, W. J.—Television screens. 29th July, 1947. (640701.)

23358. Philips Lamps, Ltd.—Circuit arrangements for producing high direct-current voltages. 6th August, 1946. (640640.)

36531. Philips Lamps, Ltd.—The sealing of lead-in conductors in hermetically sealed vessels. 11th December, 1946. (640705.)

37407. Standard Telephones & Cables, Ltd.—Ultra-high-frequency antenna. 19th December, 1946. (640706.)

37837. Kablo Akciova Tovarna na Kable Adratena Lana, Akciova Spolecnost, and Havlicek, J.—Method of establishing provisional electric light and/or power service lines and means for carrying such method into effect. 24th December, 1946. (640707.)

38128. Westinghouse Electric International Co.—Magnetrons. 31st December, 1946. (640644.)

1947

4525. Hirst Electronic Development, Ltd., and Bramson, S. M.—Electronic control circuits. 13th February, 1948. (640709.)

6913. Westinghouse Electric International Co.—Glass stem structures for electrical apparatus. 12th March, 1947. (640646.)

8216. Standard Telephones & Cables, Ltd., and Earp, C. W.—Radio-direction finders. 25th March, 1948. (Addition to 635277.) (640710.)

13422. British Thomson-Houston Co., Ltd.—Shaft sealing devices. 19th May, 1947. (640648.)

17475. British Thomson-Houston Co., Ltd., and Oldham, T. J. F.—Electric motor control systems for cranes and the like. 13th December, 1948. (640719.)

18232. British Thomson-Houston Co., Ltd.—Electric timing mechanisms for washing-machines and the like. 10th July, 1947. (640721.)

18332. British Thomson-Houston Co., Ltd.—Carrier current control systems. 10th July, 1947. (640651.)

18711. C-O-Two Fire Equipment Co.—Photo-electric detector for solids suspended in fluids. 14th July, 1947. (640725.)

21025. Standard Telephones & Cables, Ltd.—Valve amplifying circuit. 1st August, 1947. (640657.)

26143. Westinghouse Electric International Co.—Resistance welding machines. 26th September, 1947. (640663.)

30709. British Thomson-Houston Co., Ltd.—High speed rotors for centrifugal compressors and the like. 19th November, 1947. (640669.)

30946. British Thomson-Houston Co., Ltd.—Inductor eddy current type dynamo-electric machines. 21st November, 1947. (640733.)

31511. Westinghouse Brake & Signal Co., Ltd., Peter, L. H., and Walker, A. H. B.—Cathode-ray tube equipment. 19th October, 1948. (640674.)

31512. Westinghouse Brake & Signal Co., Ltd., Peter, L. H., and Walker, A. H. B.—Apparatus for the supply of high-voltage unidirectional current from a relatively low voltage alternating-current source. 28th October, 1948. (Cognate application 1257, 15th January, 1948.) (640675.)

32117. Standard Telephones & Cables, Ltd.—Electric pulse reiterating circuits. 5th December, 1947. (640677.)

33314. British Thomson-Houston Co., Ltd.—Heat-exchange apparatus for fluids. 17th December, 1947. (640680.)

33457. British Thomson-Houston Co., Ltd.—Resistance welding electrodes. 18th December, 1947. (640681.)

34738. Metropolitan-Vickers Electrical Co., Ltd.—Thermionic valves. 30th December, 1947. (640686.)

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1631. Vackar, J., and Klika, V.—Audio-frequency transformers. 19th January, 1948. (640690.)

2681. Smith, R. O.—Electrical butt-welding of metallic objects. 29th January, 1948. (640591.)

5122. Continental Carbon, Inc.—Protective coating for resistors. 20th February, 1948. (640739.)

6034. Babcock & Wilcox, Ltd., and Schaap, W. F. C.—Tubulous boilers. 21st February, 1949. (640596.)

6578. General Electric Co., Ltd., Dovey, D. M., and Evans, C. J.—Apparatus for heat-treatment of metal and other articles. 21st February, 1949. (640742.)

8104. Hoover, Ltd.—Electric toasters. 18th March, 1948. (640743.)

8399. Naamlooze Vennootschap Philips' Gloeilampenfabrieken.—Electrical measuring circuit arrangements. 22nd March, 1948. (640600.)

9811. Cole, Ltd., E. K., and Entwistle, H.—Former wound inductance coil. 7th April, 1949. (640745.)

9830. Westinghouse Electric International Co.—Direct-current generators. 8th April, 1948. (640601.)

10539. Moine et Scholler Transfostandard.—Electric soldering iron. 15th April, 1948. (640602.)

11044. Philips Electrical, Ltd.—Velocity-modulated electron-discharge tubes. 20th December, 1945. (Divided out of 640697.) (640747.)

11126. Compagnie Générale d'Electricité.—Method of and apparatus for sheathing cables with a layer of thermoplastic insulating material requiring slow air cooling. 22nd April, 1948. (640748.)

12112. British Thomson-Houston Co., Ltd., Hill, C. V., and Lowe, G. F.—Control of electric motors driving flat type hosiery machines. 3rd May, 1949. (640751.)

12254. Brazdil, J., and Jadrnicek, A.—Electric water-heater. 4th May, 1948. (640608.)

14018. M-O Valve Co., Ltd., and Bell, J.—Thermionic valves. 9th May, 1949. (640833.)

14346. General Electric Co., Ltd., and Espley, D. C.

—Combined radio transmitting and receiving equipment. 23rd May, 1949. (640835.)

15121. Cinema-Television, Ltd., and Hill, F. L.—Methods of winding coils for use in mutual inductance devices. 26th May, 1949. (640618.)

15720. Sylvania Electric Products, Inc.—Colour coding electron-discharge devices. 10th June, 1948. (640837.)

15877. Rotax, Ltd., and Bourne, W. G.—Electric switch contact mechanisms. 16th May, 1949. (640755.)

16407. Allmanna Svenska Elektriska Aktiebolaget.—Heavy current windings for electrical apparatus. 18th June, 1948. (640624.)

16916. British Telecommunications Research, Ltd., and Baker, G. T.—Frequency indicating arrangements. 6th May, 1949. (640626.)

17644. Shelton, E. E., and Tomes, G. A. R. (trading as 20th Century Electronics).—Cathode for ionization counter tubes. 25th March, 1949. (640840.)

19472. Cossor, Ltd., A. C., and Covill, D. H.—Electron-discharge valve circuits. 15th July, 1949. (640842.)

21638. Ferranti, Ltd., Thomas, G. I., and Harben, J. F. C.—Presettable tuning devices for radio receivers. 13th August, 1949. (640844.)

22081. Revo Electric Co., Ltd., and Felton, A. E.—Reflector fittings for tubular electric lamps. 16th August, 1949. (640779.)

22287. British Thomson-Houston Co., Ltd.—Ultra-high-frequency induction heaters. 24th August, 1948. (640783.)

22248. Deshaw, Z.—Capping of incandescent electric lamp bulbs. 24th August, 1948. (640782.)

22421. British Thomson-Houston Co., Ltd.—Electric capacitors. 25th August, 1948. (640790.)

22517. Battery Construction, Ltd., and Acreman, H. F.—Electric accumulators. 2nd September, 1949. (640794.)

22610. Graviner Manufacturing Co., Ltd., Wilkinson Sword Co., Ltd., and Mathisen, A.—Electric switches for use on aircraft which are automatically operable in the event of crash or impact and aircraft crash or impact detecting systems. 27th September, 1948. (640796.)

22681. British Thomson-Houston Co., Ltd., and Forsling, B. E. G.—Auxiliary gas turbine set for aircraft with cabin supercharging. 28th July, 1949. (640799.)

23286. Muirhead & Co., Ltd., and Tucker, E. W.—Electrolytic cells. 26th April, 1949. (640812.)

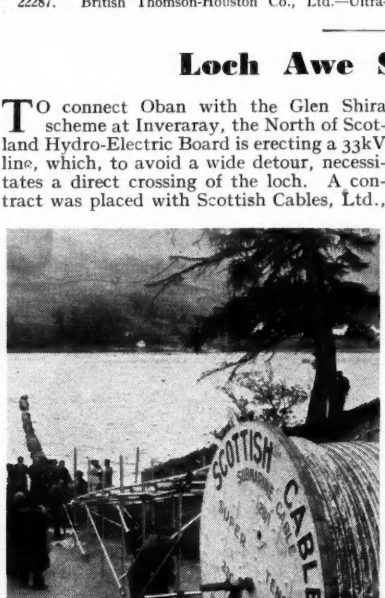
23651. British Thomson-Houston Co., Ltd., Clarke, G. H., and Harris, W. S.—Machine for winding interleaved capacitors. 14th July, 1949. (640822.)

23750. Radio Corporation of America.—Stabilizing, or measuring, of the frequency of microwave oscillations. 9th September, 1948. (640848.)

23996. British Thomson-Houston Co., Ltd.—Electric capacitors. 13th September, 1948. (640854.)

Loch Awe Submarine Cable

TO connect Oban with the Glen Shira scheme at Inveraray, the North of Scotland Hydro-Electric Board is erecting a 33kV line, which, to avoid a wide detour, necessitates a direct crossing of the loch. A contract was placed with Scottish Cables, Ltd., to manufacture and install a continuous length of submarine cable and the laying operation was recently successfully carried out.



Cable being paid out on the shore of Loch Awe

The 3-core cable has 0.1 sq in metallized paper screened conductors, and is designed for use on a 33kV system having the neutral point earthed through a Petersen coil. The finished cable measures approximately 3.6in diameter overall and weighs 53½lb per yard, the total length being 700 yd. This was wound round a 10ft 8in dia. drum, the weight of cable and drum being approximately 21 tons.

The normal method of paying out the cable from a boat was ruled out by the weight of the cable and drum, and it was decided to float the cable across by means of buoyancy drums and sink into position. In preparation for the laying operation the drum was mounted on 15-ton jacks raised above a platform of railway sleepers by specially fabricated steel stands. A sloping ramp constructed of tubular aluminium scaffolding with long wooden rollers led the cable to ground level to allow the 40-gall buoyancy drums to be attached at approximately 3-yd intervals. A strong breeze caused operations to be suspended till early afternoon, and the laying of the cable was only completed just as darkness made further operations impracticable.

Torch Battery Prices

The Board of Trade has made the Electric Torch Dry Batteries (Maximum Prices) (Revocation) Order, which frees this class of battery from price control as from 25th May.

CONTRACT INFORMATION

Accepted Tenders and Prospective Electrical Work

CONTRACTS OPEN

Where "Contracts Open" are advertised in our "Official Notices" section, the date of the issue is given in parentheses.

Australia.—Victoria.—13th September. State Electricity Commission. 66kV to 22 kV transformers. (See this issue.)

Queensland.—9th August. State Electricity Commission. 6,600 V switchboard. (C.R.E. (I.B.) 55450/50. Ten/1341.)*

Bath.—1st July. Hospital Management Committee. Electrical installation in new operating theatre block at the Royal United Hospital. A. J. Taylor & Partners, architects, 4-5, Bridge Street, Bath.

Coventry.—5th July. Housing Committee. Electrical installations in 453 dwellings. (See this issue.)

Egypt. — Cairo. — 3rd September. Three 250 kW diesel alternators for Suez refinery. (See this issue.)

Frimley and Camberley.—10th July. Street lighting tungsten filament lamps. (See this issue.)

Ilford.—26th June. Corporation. Street lighting equipment. (See this issue.)

Newcastle-upon-Tyne.—3rd July. Education Committee. Electrical installation at Hilton Primary School. (See 9th June issue.)

Northfleet.—5th July. U.D.C. Pump and electric motor at the sewage works. (See this issue.)

Romford.—21st June. Engineer and Surveyor's Department. Electrical installations in forty houses. (See 9th June issue.)

Slough.—19th June. Town Council. Street lighting equipment. (See 9th June issue.)

Stretford.—24th June. Corporation. Improvement of lighting of the drawing office and lecture room at the Technical College. (See 9th June issue.)

Tasmania.—1st August. Hydro-Electric Commission. Automatic valves for Tungatinah pipelines. (See this issue.)

Uruguay.—Montevideo.—11th July. Usinas Electricas y Telefonos del Estado. Supply of telephone switchboard indicator lamps. (C.R.E. (I.B.) 55666/50. Ten/1349.)*

Willesden.—Borough Council. Firms wishing to be placed on a list of approved contractors from whom tenders will be invited for heating, steam services, laundry and kitchen equipment and electrical installations, should apply to the borough engineer and surveyor by 26th June. (See this issue.)

*Specifications may be inspected at the Commercial Relations and Exports Department, Board of Trade, Thames House North, Millbank, S.W.1 (Victoria 9040).

ORDERS PLACED

London.—Battersea.—Borough Council. Electrical installations at the Council's St. John's Hill housing scheme (£1,183).—Phoenix Electrical Co. Installations at Salcott Road/Bolingbroke Grove housing scheme (£2,064), Westbridge Road scheme (£1,224) and Nightingale Lane/Hendrik Avenue scheme (£1,093).—London Electricity Board.

Sheffield.—Corporation Housing Committee. Recommended. Electrical installations in 342 houses on the Ballifield Hall estate (£6,336).—Hobson & Scott, Ltd.

Wallasey.—Corporation Education Committee. Recommended. Electrical installations in connection with the alteration and extension of the School of Art (£2,813).—A. V. Milton & Co., Liverpool.

CONTRACTS IN PROSPECT

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Alnwick.—School, Spring Gardens, for the Convent of Mercy (£40,000); T. J. Cahill, architect, Lloyds Bank Chambers.

Belper.—Houses (46) and four bungalows for R.D.C.; chief building surveyor, Field Head House, Chesterfield Road.

Birkenhead.—Houses (22), Windermere Road, Upton; Victoria Estates (Wirral), Ltd., Liverpool.

Birmingham.—Secondary technical school for boys, Handsworth; S. N. Cooke & Partners, architects, Sun Buildings, Bennetts Hill.

Boldon.—Houses (36), Boldon Colliery, for U.D.C.; W. D. and R. Allison & Son, builders, Whitburn.

Bolton.—Houses (120), Padbury Way and Top-o'-th'-Brow estate; housing director, Town Hall.

Caerphilly.—Houses (180), Penyrheol estate; U.D.C. surveyor, Council Offices.

Chadwell Heath.—Works extensions; Ship Carbon Co. of Gt. Britain, Ltd., Chadwell Works, Grove Road.

Clay Cross.—Flats (80), Holmgate; W. A. T. Lynam, U.D.C. surveyor.

Cleethorpes.—Houses (40), Highgate No. 4 site; borough engineer.

Croydon.—Houses (250), New Addington estate; borough engineer.

Dagenham.—Flats (54), in four blocks, Whalebone Lane South; borough engineer.

Dudley.—Junior school, Bradford Road; A. J. Crump, Ltd., Ashton Road.

Ellesmere Port.—Packaging factory for Bowater Paper Corporation, Ltd., London; Farmer & Dark, architects, 52, Grosvenor Gardens, London, S.W.1.

Exeter.—New premises for Marks & Spencer, Ltd. (about £150,000); Bovis, Ltd., contractors, 1, Stanhope Gate, London, W.1.

Falkirk.—Nurses' home at Royal Infirmary (£35,000); North East Regional Hospital Board, Albyn Place, Aberdeen.

Fareham.—Dwellings (92), Fareham Park site; U.D.C. surveyor, Westbury Manor.

Farnborough.—Technical institute (£350,000); county architect, The Castle, Winchester. (First instalment to cost £40,000).

Fawley.—Administrative buildings for Anglo-American Oil Co.'s refinery; Lanchester & Lodge, architects, 10, Woburn Square, W.C.1.

Gatley.—Buildings on 20-acre site, Heald Green, for British Rayon Research Association, Urmston; Lanchester & Lodge, architects, 10, Woburn Square, London, W.C.1.

Glasgow.—Flats (65), Elliston Drive, Priesthill; Town Clerk, City Chambers.

Houses (408), Blairdardie site; John Lawrence (Glasgow), Ltd., builders, 137, West Regent Street.

Great Yarmouth.—Industrial premises, Fenner Road; borough surveyor, Town Hall.

Grimsby.—Girls' modern secondary school, Chelmsford Avenue, and grammar school for boys, Highfield; borough engineer.

Hastings.—Secondary modern school for 360 girls at Red Lake; borough engineer.

Hereford.—Conversion of Foxley Camp for housing; Geo. Harris & Co., Ltd., Hereford.

Hoole.—Houses (24), Linden Grove, for U.D.C.; T. Warrington & Sons, Park Drive.

Ilkeston.—Houses (116), Kirk Hallam estate; A. Mason (Contractors), Ltd., Mansfield.

Ipswich.—Hostel for aged persons at Castle Hill; borough surveyor, 19, Tower Street.

Isleworth.—Lecture and residential accommodation at Maria Gray Training College (£26,693) for Middlesex C.C.; George Moss & Sons, Ltd., contractors, Southall.

Liverpool.—Reconstruction of buildings at Ministry of Pensions Hospital, Park Avenue, Mossley Hill; Humphreys, Ltd., builders, H.22, Exchange Buildings.

London.—HOMERTON.—Flats (349) maisonnettes and shops, Frampton Park Road, for L.C.C.; Henry Tanner, architect, 134, Fenchurch Street, E.C.3.

WOOLWICH.—Out-patients' department at the Memorial Hospital (£47,500); South East Metropolitan Regional Hospital Board, 11a, Portland Place, London, W.1.

Lowestoft.—Houses (42), No. 2 estate; borough surveyor.

Manchester.—Shops, maisonnettes and garages in two blocks, Portway, Wythenshawe; city architect.

Newcastle-on-Tyne. — Secondary modern school, Blakelaw estate; city architect, 18, Cloth Market.

Newmarket.—Junior and infants' school, Houldsworth Valley, West Suffolk; county architect, 13, Westgate, Bury St. Edmunds.

Newport (Salop).—Houses (36), Long Meadow site, for U.D.C.; Wm. Sharratt, Ltd., Church Lane, Wolverhampton.

Norfolk.—Schools, Burnham Market and Feltwell; W. O. Bell, chief education officer, Stracey Road, Norwich.

Portsmouth.—Fire station, Cosham; city architect.

Shops and offices, 183-185, Commercial Road, Landport; Upsons, Ltd., 7-31, Great Dover Street, S.E.1.

Seaton Valley.—Houses (198), Seghill; T. W. Burgess, surveyor, Council Offices, Seaton Delaval.

Southend-on-Sea.—Rehabilitation block at General Hospital; North East Metropolitan Regional Hospital Board, 11a, Portland Place, London, W.1.

Spennymoor.—Houses (102), York Hill housing site, for U.D.C.; G. H. Gray & Partners, architects, Camden Street, North Shields.

Stockton Heath.—Houses (76) for Admiralty; W. H. Worthington, Ltd., builders, 61, Rusholme Grove, Manchester, 13.

Stourport-on-Severn.—Houses (48), Walshes Farm estate, for U.D.C.; P. Cox, Quarry Bank, Brierley Hill, Staffs.

Stratford-on-Avon.—Houses (19), Redlands estate, Stratford-on-Avon Builders, Ltd., Tiddington, Stratford.

Sunderland.—Old people's hostel, Thorney Close estate (£15,000); borough architect, Stockton Road.

Tottington (Bury).—Extensive development of factory; Kirklees, Ltd., art silk manufacturers.

Wallasey.—Single-storey office block, Riverview; J. H. Waring, Ltd., 289, Hoylake Road, Moreton, Wirrall.

Walsall.—Flats (68), Alumwell Road; Sir A. McAlpine & Son, Ltd., Wolverhampton.

Warrington.—Houses, Great Sankey (28) Poulton-with-Fearnley (10), Rixton-with-Glazebrook (8) and Wimwick (10); S. C. Oxley, R.D.C. surveyor.

Wednesbury.—Houses (126), Dangerfield Lane site; borough architect.

Wembley.—Houses (30), Barn Rise and Beverley Gardens; Geo. Wimpey & Co., Ltd., 27, Hammersmith Grove, W.6.

Worcester.—Adaptation of "The Firs," Whittington, as a children's nursery (£36,105); city engineer.

York.—Flats (30), Navigation Street; C. J. Minter, city engineer, Guildhall.

Fatality

A VERDICT of "Accidental Death" was recorded at Symonds Yat, Herefordshire, on 5th June on a seven-year-old boy who was found dead with his left hand underneath an electric wash boiler. Mr. S. G. R. Hart, electrician, of Coleford, stated that these wash boilers were fitted with a covering plate underneath, but this one, bought second-hand a few days before the accident, was not fitted with any protection against live wires inside.